INDIANA WORKFORCE DEVELOPMENT

Root Causes Cover Sheet

Economic Growth Region # 10 : "Southern 7"

1. Designated Grantee			
Organization Name: Southern 7 Workforce Investment Board, Inc.			**Telephone Number:** 812-944-7793
Address: P.O. Box 6712			**Fax Number:** 812-944-4056
Address: 3131 Grantline Rd., 2nd Floor			**Email Address:** rm@south7work.org
City: New Albany	**State:** Indiana		**Zip + 4:** 47151-6712
County: Floyd	**FEIN:** 35-2148244		
2. Contact Person			
☐ **Mr.** ☐ **Ms.** ☐ **Dr.** ☐ **Other**	**First Name:** Ron		**Last Name:** McKulick
	Title: Executive Director		**Telephone Number:** 812-944-7793
Address: P.O. Box 6712			**Fax Number:** 812-944-4056
Address: 3131 Grantline Rd., 2nd Floor			**Email Address:** rm@south7work.org
City: New Albany, In	**State:** Indiana		**Zip + 4:** 47151-6712
Member:	**Name**		

Lead Team Members

Name:	**Industry:**	**Title:**	**Signature:**
Mike Ford	Healthcare	HR Director	
Kathy Clayton	Organized Labor	Director/LIFT	
Vicki Kellerman	Economic Development	Washington County EGP Executive Director	
Uric[illegible] DuFrene	Education	Dean-Bus. School IU Southeast	
Paul Perkins	Advanced Manufacturing	Amatrol ~~Vice~~ President	
Tom Hollkamp	Education	Director— Workforce Dev. Division	
Robert Peacock	Economic Development	Scott County EGP Executive Director	

Indiana Workforce Development
STRATEGIC SKILLS INITIATIVE

PHASE 2
Report on *ROOT CAUSES*
for
Current and Projected
Critical Occupational Shortages &
Skills Shortages

Target Sectors:
1) Healthcare,
2) Manufacturing and
3) Logistics (as relates to Manufacturing)

Economic Growth Region 10
(Clark, Crawford, Floyd, Harrison, Scott and Washington Counties, Indiana)

December 30, 2005

Submitted by:

1. **Core Agent: Southern 7 Workforce Investment Board, Inc., and SSI Work Team:**
   - **Dr. Jay White, Indiana University Southeast (IUS)**
   - **Jennifer Wilcox, Jennifer Wilcox Consulting**
   - **Thayr Richey, Strategic Development Group (SDG)**

Table of Contents

List of Tables

List of Figures

EXECUTIVE SUMMARY

This is the second of three reports to address the objectives of the SSI for Economic Growth Region 10 (EGR 10). The goals of the Root Causes Report are to determine, analyze and rank the underlying factors that lead to shortages in industry-specific critical occupations identified during the first phase of the SSI. With the line-of-sight approach, solutions will be crafted that include 1) both short-term and long-term investments, and 2) both public sector investment fueled by Indiana Workforce Development, employer investment and, as available, other investment through federal, foundation and other resources. For EGR 10, which includes Clark, Crawford, Floyd, Harrison, Scott and Washington counties, Healthcare and Advanced Manufacturing/Logistics were identified as strategically critical industries. In the Phase 2 Root Cause work, nineteen (19) critical occupations have been reshaped into two categories and a separate tier titled "Emerging Occupations". Category 1 occupations gain primary SSI attention. Healthcare includes three (3) Category 1 occupations: Registered Nurses, Respiratory Therapists and Lab Technicians. Advanced Manufacturing/Logistics has four (4) Category 1 occupations: Production Workers, Machinists, Industrial Maintenance Technicians, CDL Drivers. The Emerging Occupation identified involves Industrial Engineering Technicians. Eleven (11) other critical occupations have been recast as Category 2, based on relatively less robust primary and secondary data indicators. Six (6) industry-wide skills shortages have also been clearly identified. The Root Cause analyses is demand-driven; it is based substantially on a variety of employer inputs (electronic, 1-to-1, group, etc.) and on a survey of workers in the targeted fields. The analyses of these occupational and skills shortages respectively paves the way for specific industry solutions. In turn, the effectiveness and success of these solutions embed and institutionalize the SSI process for the region's long term usage, replicating SSI methodologies and positive "human capital" outcomes across a wide range of business/industry sectors.

Following SSI Methods and Guidance for the Root Causes Report, occupational shortage factors were looked for in the following areas:

1. Employer HR policies & practices
    a. Recruitment
    b. Supervision
    c. Inadequate HR capability
2. Education and training capacity and student/completion/placement
    a. Academic & other requirements for entry
    b. Duration of programs
    c. Cost & accessibility of programs
    d. Present & planned capacity for intake into programs
    e. Present & actual intake into programs
    f. Persistence rates and completion rates

    g. Program quality
3. Pipeline issues
    a. Career awareness
    b. Social perception
    c. Public education
    d. One-stop centers
4. Leakage
5. Wage rates & benefits

In order to provide consistency across all methods for primary data gathering, each method was designed with these areas as the foundation. Thus, the comparison of results across various methods is not only consistent but statistically appropriate. Further, a number of activities were undertaken by EGR 10 to ensure that our Consortium of employers had ample opportunity to participate in the Root Cause Analysis process.

Methodology

The **Root Cause ranking process** is based first on the primary data content and frequency of employer inputs (and worker inputs to a degree). EGR 10 Phase 2 methodology offered a variety of ways in which employers could participate. This approach served to make Phase 2 involvement more convenient and accessible to a wide range of employers cutting across all six (6) counties, per targeted sector. Inputs include: 1) On-line surveying through Survey Monkey.com, 2) 1:1 field interviews with employers, and 3) employer focus group. With each employer engagement/input medium, the SSI work team used the SSI Phase 2 Guidebook structure consistently, focusing Root Cause queries on five types of possible root causes, i.e. HR, Wages and Benefits, Pipeline Issues, etc.
Secondly, the content and frequency of on-line survey and interview-based employer inputs was presented and discussed extensively at the employer focus group, providing further discrimination and ranking of root cause factors for occupational and skills, per occupation and sector. Thirdly, through mid-December, the first data inputs from healthcare worker surveying was received.

Based on these processes, ranking further occurred through an extensive work session with the EGR 10 SSI work team. The work team conducted visual/graphic cause mapping for each of the nine (9) critical occupations (Reference: thinkreliability.com) and, based on employer input frequencies and further overall evaluation of each map, causes were ranked numerically in a draft form. The draft maps and rankings were then presented to the Core Team for their discussion, further mapping analysis and ranking changes. Of importance, the initial rankings by employers were reviewed in a 2-phase process by the work team and Core Team to ensure objectivity and a comprehensive "look" in 1) analyzing and then 2) ranking the root cause issues associated with each occupation and map. Mapping was instrumental in delving more deeply into each occupation's root causes.

Cause Maps, Root Cause Ranking, & Shortage Sensitivity

The steps and tools in the root causes analysis process generated a great deal of data, both from primary and secondary sources as outlined above, and led to outlines for root causes and root cause rankings. This data was used to construct detailed cause maps for each occupation and to develop root cause rankings and sensitivities for each occupation. The cause maps and the root cause ranking tables developed are presented throughout this report in a manner that allows a reader a quick synopsis of the factors leading to worker shortages and the ranking of those factors.

In each map, as we move from left to right an attempt is made to answer the question "why?" Why does a shortage exist for this occupation? After the root causes were determined, each cause was ranked relative to the other causes. A number was assigned to each cause to measure the impact of that cause on the worker shortage with a rank of 1 indicating the largest contributing factor. When two or more root causes were determined to have a similar impact on the shortage they were assigned the same rank.

Keeping the line-of-sight and the solutions phase in mind, a Solution Suitability Factor was established for each cause in an attempt to rank which, if any, of the contributing factors is appropriate for SSI funding. This is a tentative step in determining which causes are appropriate for targeting by the workforce system The potential suitability ranking assigned to each root cause are:

Solution Suitability Rank	Rank Meaning
1	There is a high likelihood that significant impacts can be made on the root cause that would lead to a measurable reduction in the occupational shortage through SSI funding. An example would be where dollars could go directly towards reducing the cost of training for employees or potential employees and would hopefully lead to a quantifiable outcome.
2	Opportunities for solution development are possible but the impact is less certain or possibly smaller than a 1 ranking.
3	Although solution development opportunities are possible, many constraints exist which would limit the returns of SSI investment.
4	This category indicates that the root cause is outside the locus of control (e.g. the aging population and some leakage situations) and therefore inappropriate for SSI funding.

Finally, sensitivities for each occupational shortage were determined. A section is provided for each occupation that discusses the potential impact on the shortage as certain root causes are addressed. An impact can be made, hopefully in a timely manner for some occupations with carefully designed solutions. Unfortunately for some occupations the root causes are so systemic and interrelated that a complex and resolute effort by multiple stakeholders will be required to curb long-term worker shortages.

Health Care

For EGR 10, the sector that experienced the largest job growth was Healthcare with an additional 988 jobs being created over the 2001 – 2004 time frame. Healthcare is the third largest employer in Region 10, responsible for 10.7% of the region's employment. The largest employers within the healthcare field are Hospitals and Ambulatory Health Care services and these two areas also have experienced the largest growth in employment.

In the original Occupation and Skills Shortage Report eight critical occupations were projected to be in shortage. Those eight occupations were later pared to three outlined below:

Category 1 – Healthcare

Occupation	SOC
Registered Nurses	29-1111
Laboratory Technicians (Medical & Clinical)	29-2012
Respiratory Therapists	29-1126

Median salaries, benefits, projected job growth and projected short-run and long-run shortages are provided in below.

Critical Healthcare Occupation Wage, Benefit, and Shortage Estimates

HEALTHCARE PRIMARY TARGET OCCUPATIONS						
					Projected Shortage	
Occupation	Median Salary	Average Annual Benefits	# of Jobs 2002	% Growth 2002-2012	2007	2012
Registered Nurses	$50,000	$15,128	2,092	27%	79	116
Medical and Clinical Laboratory Technicians	$28,970	$9,229	115	16%	16	40
Respiratory Therapy	$40,200	$10,416	26	34%	27	12
Sources: Kentuckiana Occupational Outlook (benefits) & Bureau of Labor Statistics, Occupational Employment Statistics Survey						

The root causes for all health care occupations along with ranking and solution suitability scores are provided on the following page.

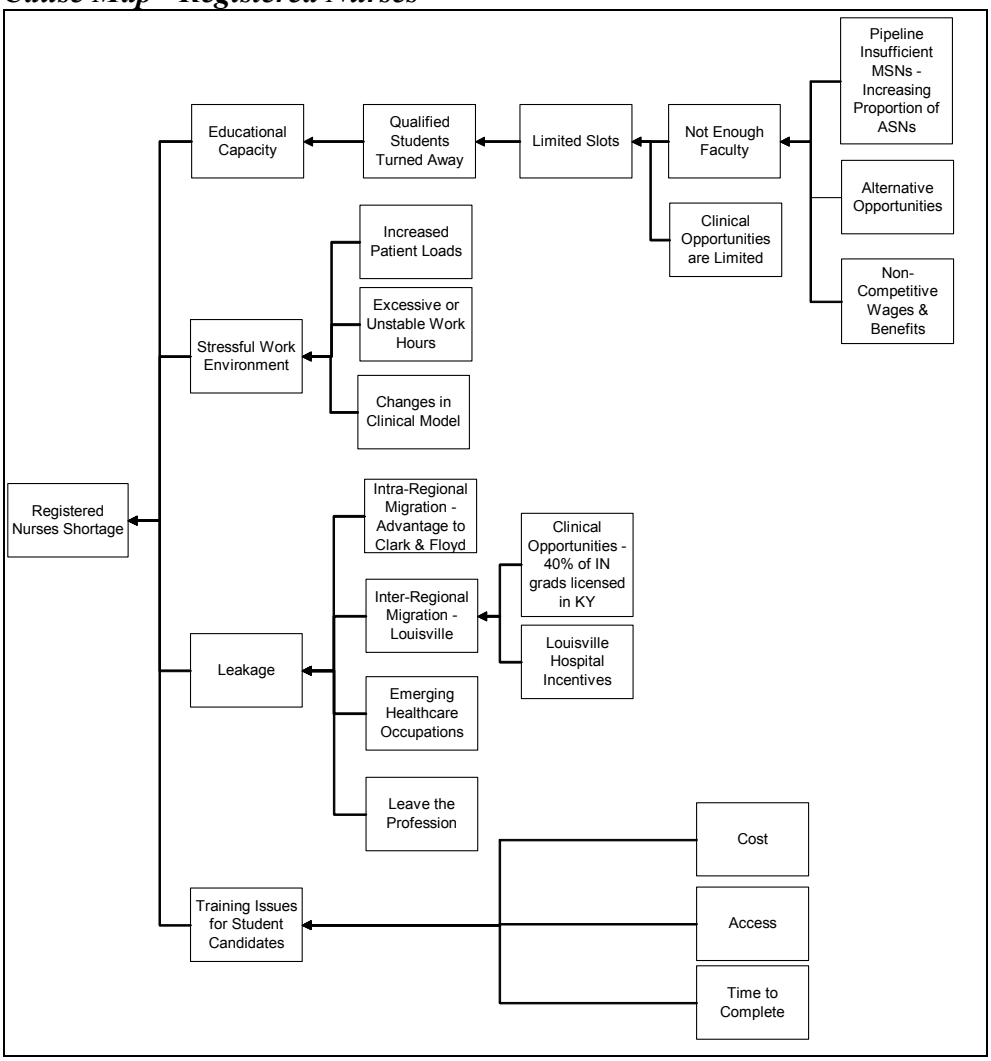
Root Cause and Potential Solution Impact Ranking Healthcare Occupations		
Root Cause	**Relative Importance/Impact[a]**	**SSI Solution Suitability Factor (Line of Sight)[b]**
Respiratory Therapists		
Education Program Output	**1**	**2**
Leakage – To Louisville & From Hospitals	**2**	4
Burnout & Travel	3	**2**
Registered Nurses		
Educational Capacity	1	3
Stressful Work Environment	**2**	**2**
Leakage	3	4
Training Issues for Student Candidates	4	**1**
Laboratory Technicians		
Career Ladder/Matrices Not Communicated	**1**	**2**
Wages & Benefits (Insufficient for a family)	**1**	4
Requires Certification	2	3

Additional detail for each occupation is provided below. As space is limited root cause details are presented graphically using cause maps.

Nursing

The root causes for the nursing shortage are summarized in a cause map below. Increasing nursing wages, while desirable, will not be sufficient to curb the nursing shortage. This strategy is necessary and would attract new entrants into the field but the other causes must be addressed to stem attrition. Furthermore, even if new entrants are attracted to nursing staffing shortages at educational sites would lead to qualified entrants being turned away.

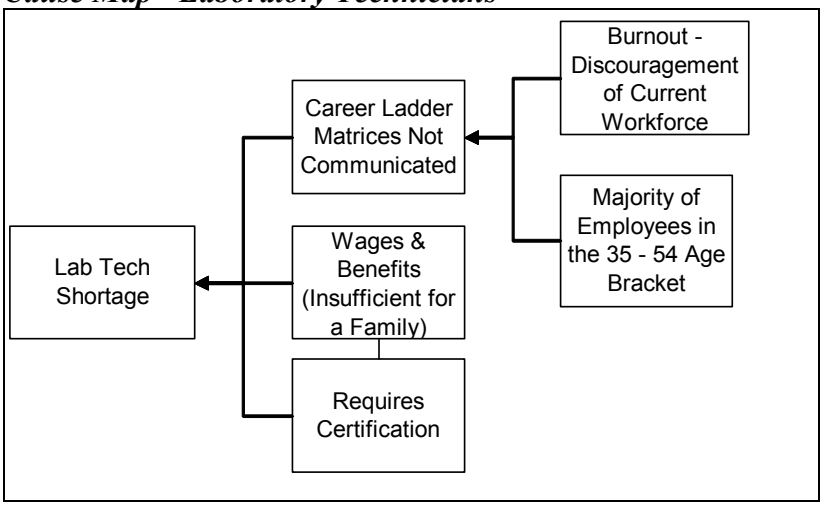
Cause Map - Registered Nurses



Laboratory Technicians

The cause map for this occupation is shown below. Although better wages would certainly help with the shortage, additional efforts to assist with certification and additional training or resources for training would likely prove fruitful. Assistance with training for other areas would make this occupation more attractive by creating more options and making it part of a career lattice or matrix.

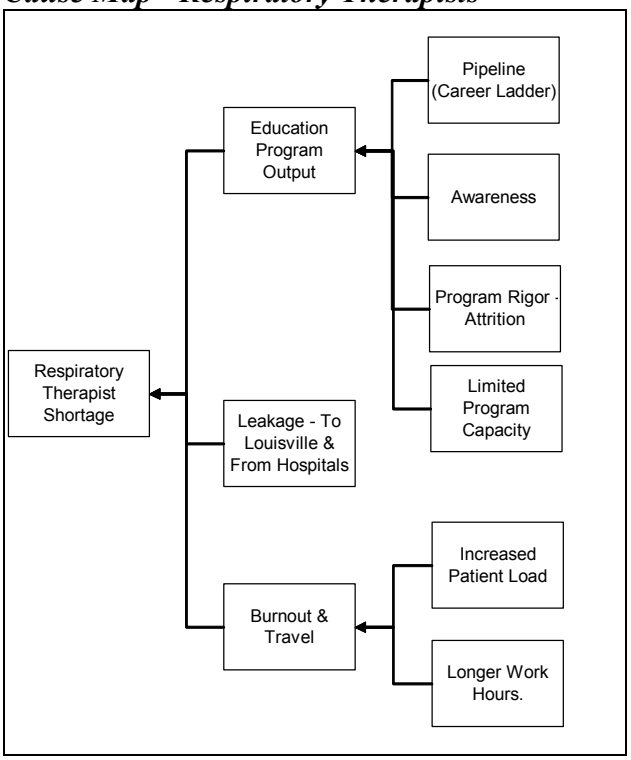
Cause Map - Laboratory Technicians



Respiratory Therapists

This is a field where significant gains can be made by increasing awareness of the program. Many potential candidates simply are not aware of this occupation as a career choice and are not aware of the RT program at Ivy Tech. A larger population of graduates will alleviate the staffing problems associated with this field.

Cause Map - Respiratory Therapists



Manufacturing/Logistics

In the original Occupation and Skills Shortage Report nine critical manufacturing were projected to be in shortage. Those nine occupations were later pared to the three outlined below through the process described in the methodology section:

Category 1 – Manufacturing/Logistics

Occupation	SOC
Industrial Maintenance Technicians	49-9041
Machinists (Metal & Plastic)	51-4041
Production Workers – Other	51-9198

In addition, Industrial Engineering Technicians were targeted as a strategic shortage occupation and has since been categorized as emerging or changing do to the rapidly evolving skills required.

The final occupational area was in the Logistic sector, namely Truck Drivers (Heavy Tractor-Trailer). Median salaries, benefits, projected job growth and projected short-run and long-run shortages are provided below.

Manufacturing/Logistics Occupation Wage, Benefit, and Shortage Estimates

MANUFACTURING/LOGISTICS PRIMARY TARGET OCCUPATIONS						
					Projected Shortage	
Occupation	Median Salary	Average Annual Benefits	# of Jobs 2002	% Growth 2002-2012	2007	2012
Machinists	$35,600	$12,866	562	14%	58	91
Production Workers	$22,500	$8,128	1264	10.8%	139	189
Industrial Maintenance Technicians	$44,600	$13,451	233	21.0%	53	35
Industrial Engineering Technicians	$35,900	$10,037	70	14.0%	N/A	N/A
Truck Drivers, Heavy and Tractor-Trailer	$31,480	$10,608	2,448	20%	195	461
Sources: Kentuckiana Occupational Outlook (benefits) & Bureau of Labor Statistics, Occupational Employment Statistics Survey						

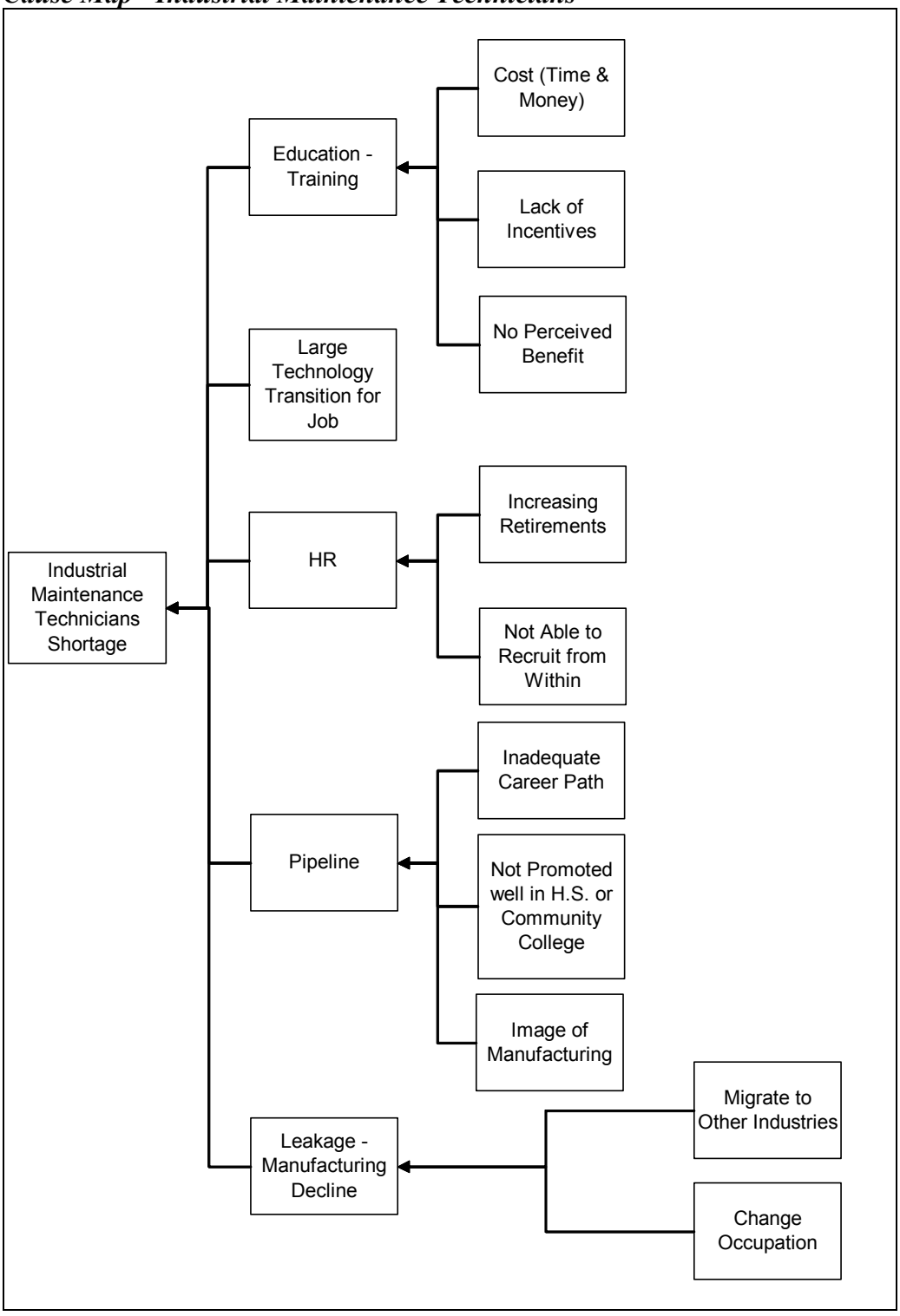
The root causes for all health care occupations along with ranking and solution suitability scores are provided on the following page.

Root Cause and Potential Solution Impact Ranking Manufacturing/Logistics		
Root Cause	**Relative Importance/Impact[a]**	**SSI Solution Suitability Factor (Line of Sight)[b]**
Industrial Maintenance Technicians		
Education – Training	**1**	**1**
Large Technology Transition for Occupation	**1**	4
Human Resource Issues	**2**	**2**
Pipeline	3	**2**
Machinists		
Training Inadequate or not Available	**1**	**2**
Image	**1**	**2**
Ineffective Recruitment	**1**	**2**
Production Workers (Laborers & Helpers)		
High Turnover	**1**	**2** – 3
Recruitment	**1**	**1**
Corporate Culture	**2**	3
Truck Drivers – CDL (Heavy Tractor-Trailer)		
Educational Capacity – Output	**1**	**2**
Turnover	**1**	3
Insurance	**2**	4
Industrial Engineering Technicians		
Pipeline	**1**	**1**
Recruitment	**2**	**1 – 2**
Education	**1**	**2**
Leakage	3	4

Industrial Maintenance Technicians

Addressing training and image issues are likely to provide substantial reductions in the shortage for this occupation. A number of strategies can address both issues simultaneously such as partnering with high schools and developing apprenticeship schools. Incumbent worker competencies could be examined to assist workers in transferring their skills to this occupation from those in decline.

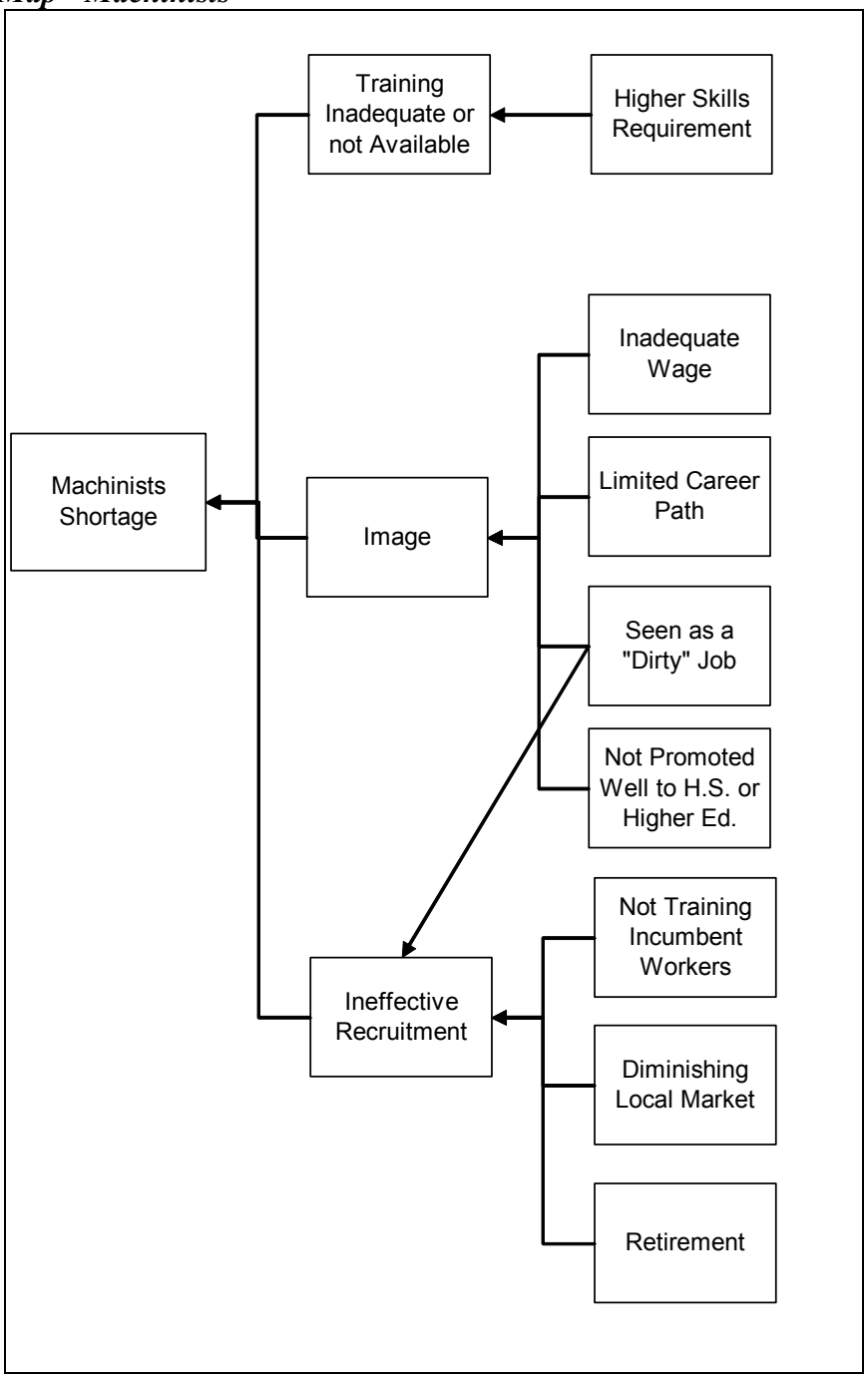
Cause Map - Industrial Maintenance Technicians



Machinists

The image of manufacturing as a declining industry with only low paying jobs must be addressed and the various career paths promoted. Facing this issue and providing training along with appropriate incentives and rewards will have a measurable impact recruitment and retention and go a long way towards reducing this shortage.

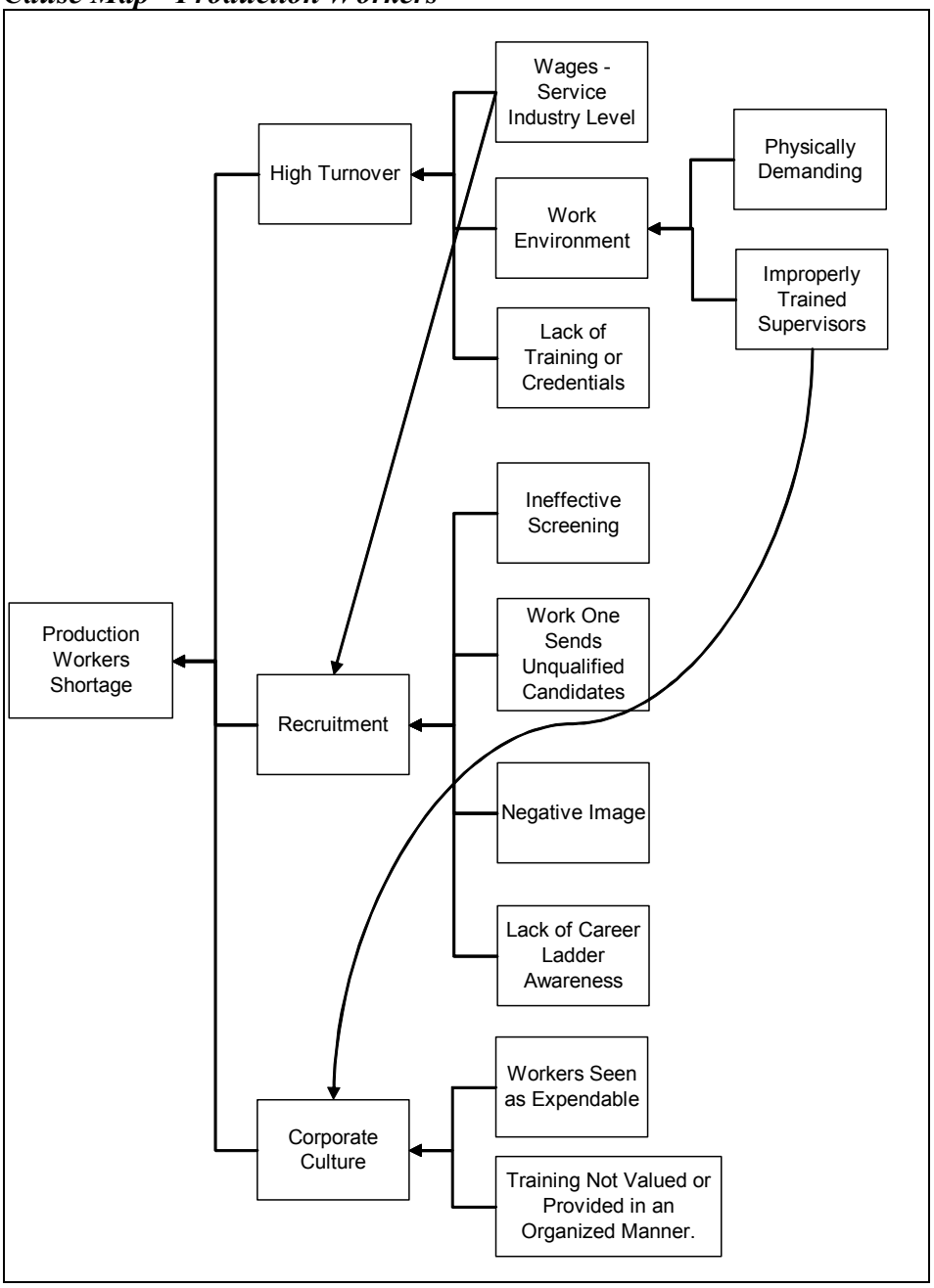
Cause Map - Machinists



Production Workers (Helpers & Laborers)

Evolving skills are needed for manufacturing at all levels. Employers must do more than make training available, they must provide appropriate incentives for training to show that it is valued by the employer and beneficial to the worker. Any efforts that lead to increased training or the increased utilization of currently available training will likely reduce turnover. Other than higher wages, work towards changing the image of manufacturing and providing career ladders or simply increasing awareness about career ladders will have the biggest impact on recruitment efforts.

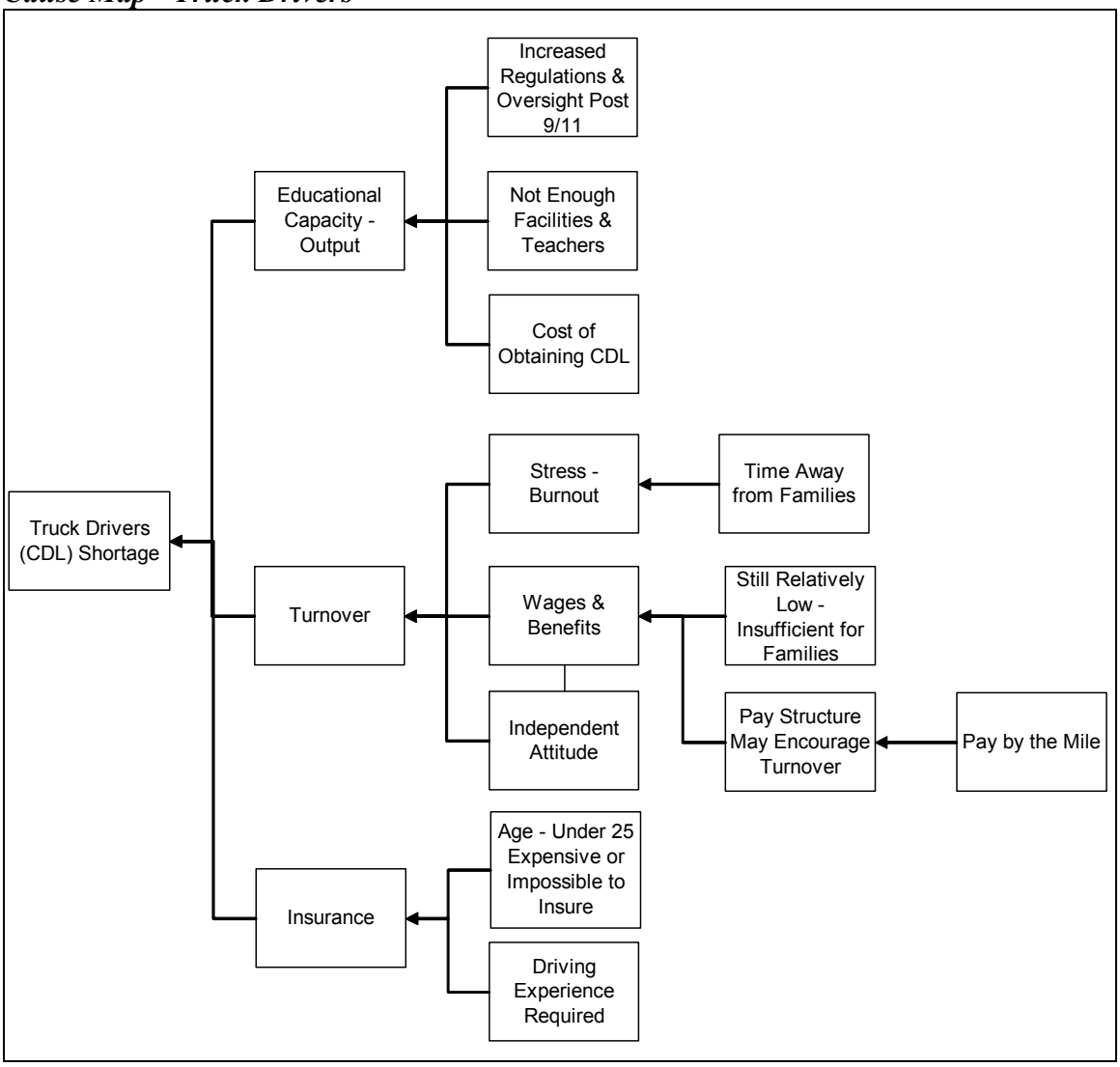
Cause Map - Production Workers



Truck Drivers

This is another occupation where an increase in wages would attract more workers but possibly not be adequate to keep them in the field. The same is true regarding assisting applicants in obtaining their CDL. Many may try the job out and decide the lifestyle issues more than offset any higher wages. The nature of the job precludes the lifestyle from being changed too much, but employers can become more creative in scheduling to allow more time and home and coordinating shipments through hub systems to reduce the distance from home that truckers must drive. Further, unless the structure of the wages is modified to address downtime and seniority there will continue to be high turnover rates.

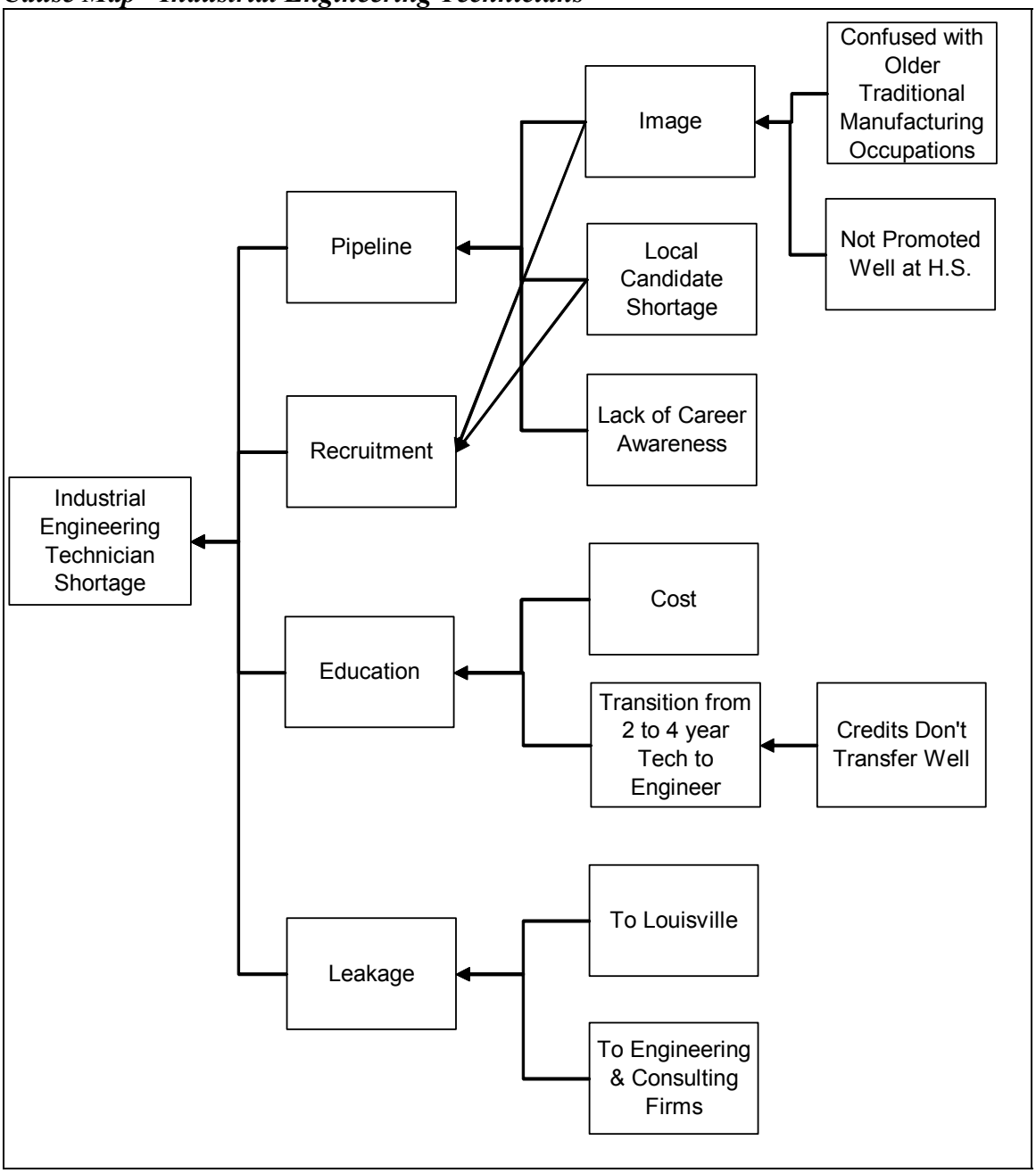
Cause Map - Truck Drivers



Industrial Engineering Technicians

It seems likely that only higher salaries will impact the leakage issue. However many of the pipeline and recruitment issues can be addressed by tackling the image problem associated with manufacturing and by increasing career awareness for the many job functions available under this category.

Cause Map - Industrial Engineering Technicians



The modules listed below are based on industry-wide skills shortages identified by sector employers overall. The six skills have been cross-walked with SSI Phase 2 website data and are described as modules, as such amenable to become curricula and learning materials that can be delivered in the future in various modes to employers, based on company need, interest and investment.

Skills Modules Attributable Across All Critical Occupations

Skill Module	Skill Sets to be Addressed	
Computer/Technology	Active Learning Critical Thinking Equipment Maintenance Equipment Selection Installation Judgment & Decision Making Mathematics Monitoring	Operation and Control Operation Monitoring Problem Solving Quality Control Analysis Reading Comprehension Repairing Troubleshooting
Employability Skills	Active Learning Active Listening Critical Thinking Judgment & Decision Making Mathematics Monitoring	Reading Comprehension Social Perceptiveness Speaking Time Management Writing
Supervisory Skills	Active Learning Active Listening Complex Problem Solving Coordination Critical Thinking Instructing Judgment & Decision Making Mathematics Monitoring	Personnel Resources Management Quality Control Analysis Reading Comprehension Social Perceptiveness Speaking Speaking Time Management Troubleshooting Writing
Teamwork	Active Learning Active Listening Coordination Critical Thinking Instructing Judgment & Decision Making Monitoring	Problem Solving Quality Control Analysis Social Perceptiveness Speaking Time Management Troubleshooting
Mathematics Aptitude	Active Learning Critical Thinking Judgment & Decision Making Problem Solving Reading Comprehension Science	
Oral Communication Enhancement	Active Learning Active Listening Critical Thinking Judgment & Decision Making Social Perceptiveness Speaking	

INTRODUCTION

With the Strategic Skills Initiative (SSI), Indiana is addressing the fundamental need for strategic investment in the skills of its workforce. Such investment is necessary if Indiana is to build lasting competitive advantage, via its various regional economies, in the context of a global economy marked by knowledge, technology and innovation. A basic means to long-term competitive advantage, that is, both divers and desired business retention and attraction success, lies with reliable and adequate availability of a competent, skilled workforce. Recognizing that such investment requires policies and conditions that forge and sustain a high level of per capita income and continued economic growth, the Strategic Skills Initiative's (SSI) foremost goal is to design and implement long-term, effective solutions to key workforce issues associated with particular business/industry sectors which have been verified as primary economic drivers in any given Economic Growth Region (EGR). Three assumptions are essential to SSI work:

1) Human capital, i.e. people are our strongest economic asset,

2) Employers must be engaged in identifying the shortages and their "whys", and they must invest consistently in the solutions, and

3) As individuals gain competencies in skilled occupations, they have real opportunity to earn a better living.

SSI methodology relies on a demand-driven line-of-sight process:

1) Identify the business/industry sectors, using mechanisms such as shift-share analysis,

2) Identify current and/or projected critical occupations in each sector,

3) Identify current and/or projected shortages in those critical occupations, and identify sector-based skills shortages,

4) Determine, analyze and rank the root cause "whys" for these shortages, and

5) Design solutions to mitigate or resolve the shortages, thus strengthening the sector's economic status.

SSI seeks to not only resolve specific occupational shortages and skills gaps in key sectors, but to establish demand-side and supply-side systems that proactively expand the needed skilled-labor supply for the future, helping to create a substantial "win" for both business and the employee in terms of wealth creation and, consequently, fuller investment by individuals, families, companies, etc. in their communities.

This is the second of three reports to address the objectives of the SSI for Economic Growth Region 10 (EGR 10). The goal of the Root Causes Report is to determine, analyze and rank the underlying factors that lead to shortages in industry-specific critical occupations identified during the first phase of the SSI. With the line-of-sight approach, solutions will be crafted that include 1) both short-term and long-term investments, and 2) both public sector investment fueled by Indiana Workforce Development, employer investment and, as available, other investment through federal, foundation and other resources. For EGR 10, which includes Clark, Crawford, Floyd, Harrison, Scott and Washington counties, Healthcare and Advanced Manufacturing/Logistics were identified as strategically critical industries. In the Phase 2 Root Cause work, nineteen (19) critical occupations have been reshaped into two categories and a separate tier titled "Emerging Occupations". Category 1 occupations gain primary SSI attention. Healthcare includes three (3) Category 1 occupations:

Registered Nurses, Respiratory Therapists and Lab Technicians. Advanced Manufacturing/Logistics has four (4) Category 1 occupations: Production Workers, Machinists, Industrial Maintenance Technicians, CDL Drivers. The Emerging Occupation identified involves Industrial Engineering Technicians. Eleven (11) other critical occupations have been recast as Category 2, based on relatively less robust primary and secondary data indicators. Six (6) industry-wide skills shortages have also been clearly identified. The Root Cause analyses is demand-driven; it is based substantially on a variety of employer inputs (electronic, 1-to-1, group, etc.) and on a survey of workers in the targeted fields. The analyses of these occupational and skills shortages respectively paves the way for specific industry solutions. In turn, the effectiveness and success of these solutions embed and institutionalize the SSI process for the region's long term usage, replicating SSI methodologies and positive "human capital" outcomes across a wide range of business/industry sectors.

EGR 10 is poised to make optimal long-term use of the SSI process and resources to benefit regional economic stability, improvement and growth. Sector-based occupational shortages and skills shortages are well defined. Key area issues are acknowledged, such as: 1) Regional educational attainment rates and wages respectively lag the state and national averages, and 2) Declines are seen in the region's largest employment share base: manufacturing. However, this most southern, central area of Indiana shows a growing readiness to step more fully into the knowledge and innovation economy, both directly in terms of sectors producing goods and providing services, and indirectly in terms of industry sectors that create the infrastructure base necessary to feed economic growth exponentially for the long-term. EGR 10 possesses strong potential to

serve as the economic engine for southern Indiana as it links with Evansville, Columbus and Indianapolis, Madison, and the Louisville, Kentucky area. Instances of such potential are offered:

1. EGR 10 is anchored in a 5-star TDL location with Louisville, Kentucky. For example, the Clark Maritime Center ((http://www.portsofindiana.com/poi/jeffersonville/), the UPS Worldport, and Louisville International Airport expansion, expanded locks on the Ohio River inland waterway. Logistically, EGR 10 is a day's drive from approximately 50%+ of the U.S. population, cities and business.
2. EGR 10 will see significant skilled workforce expansion over the next 10-15 years in the construction and engineering fields with the Bridges project ((http://www.kyinbridges.com/). This project is one of the top five federally funded construction projects in the nation, with a $2+ billion cost. Recently, Kentucky-based data indicates notable workforce needs herein after accounting for in-migration skilled labor projections.
3. The Louisville, Kentucky area, which borders EGR 10, has world class healthcare research/practice specialties, such as cardiovascular care and transplants, along with a growing biotechnology research←→venture capital←→product design and production base in conjunction with metro area university research investment. Metro-connected spill-over to the southern Indiana area is inevitable: hospital expansions in Clark, Floyd and Harrison Counties, Cancer Care Center, medical device manufacturing (MedVentures, etc.) have or are currently in the works.

4. The River Ridge Commerce Center® (RRCC) (http://riverridgecc.com/index.htm) is located on Indiana Highway 62 in Clark County, Indiana and will be the largest industrial and commercial site in the Louisville Metropolitan area. River Ridge includes around 6000 acres of land under common site control in the Louisville metropolitan area being developed as a modern business park. Per its Master Development Plan, the primary purpose for the redevelopment of the Indiana Army Ammunition Plant is the creation of new employment opportunities that will contribute to the diversification of Clark County's employment base. According to RRCC's "Draft Redevelopment Alternatives Summary of Major Findings and Conclusions" (March 19, 2001), three twenty-(20) year development scenarios were posited, with job projections ranging from 6,257 jobs to 10,674 jobs on Center property. The supply of readily developable industrial land, including warehouse distribution uses, is decreasing in the Louisville metro area. Most new development is occurring in communities 30 to 40 miles from the Louisville International Airport. River Ridge is well located, from a regional perspective, to capture a reasonable share of future market growth for distribution and manufacturing space. Regionally, RRCC's development will likely have a positive impact on the economic development status of the surrounding communities.
5. With its Clark and Floyd County base, the Southern Indiana Chamber of Commerce reflects 65% of the region's business and industry. The organization is transforming to the organizational model of Greater Louisville, Inc. As such, the Southern Indiana Chamber will merge with the Southern Indiana Economic

development Council and the SI2020 planning organization and adopt a new name and brand: Greater Southern Indiana. Southern Indiana's economic future is tied to/with the Louisville, Kentucky. Together, they are a large part of a 24-county bi-state regional economy, based on BLS data (http://monitor.louisville.edu/). These two organizations will work more and more collaboratively around economic development—education—workforce development issues, for instance, via Business Sector Networks, the new HIRE Education forum, the Graduate! Greater Louisville campaign, the bi-state Workforce Education Initiative, as well as early childhood literacy programs/grants in the bi-state area, EITC asset-building coalitions in the bi-state area (Such coalition work connects readily with One Stop employment offices), and a productive working relationships between the Southern 7 workforce board and the Louisville area WIB; for example, the regional study on underemployment (7/05).

Methodology

Although a total of 18 occupations were originally identified that list was further refined to develop a list that would be tractable for the second and third phases of the SSI. The final list of occupations was developed through core team interviews, survey responses, and surveying focus group participants. Four criteria were utilized while refining the list:

- Must be considered "critical" to the growth and/or competitiveness of an identified key industry.
- Demonstrate strong employment demand for the occupation.
- Provide good earnings and benefits.

- Be appropriate for targeting by the workforce system.

The refining process lead to a classification system where occupations were ranked as Category 1 or Category 2 based on the criteria outlined above. For healthcare the following occupations were targeted:

Category 1 – Healthcare

Occupation	SOC
Registered Nurses	29-1111
Laboratory Technicians (Medical & Clinical)	29-2012
Respiratory Therapists	29-1126

Category 2 – Healthcare

Occupational Therapists	29-1122
Pharmacists	29-1051
Physical Therapists	29-1123
Radiological Technicians	29-2034
Licensed Practical & Vocational Nurses	29-2061

When ranking healthcare occupations there was a tie in constituency votes between physical therapists and respiratory therapists. Keeping the ultimate solutions phase in mind, focusing on respiratory therapists will likely provide more "bank-for-the-buck." This is due to the relatively more stringent admission requirements and more limited training programs available within EGR 10 for physical therapy. Furthermore, physical therapy assistants, who are trained to perform similar clinical tasks under PT supervision, are not in shortage in EGR 10.

For advanced manufacturing/logistics the classification is as follows:

Category 1 – Manufacturing/Logistics

Occupation	SOC
Industrial Maintenance Technicians	49-9041
Machinists (Metal & Plastic)	51-4041
Production Workers – Other	51-9198
Truck Drivers – CDL (Heavy Tractor-Trailer)	53-3032

Category 2 – Manufacturing/Logistics

First-line Supervisors/Managers	51-1011
Computer Techs (support specialists)	15-1041
Welders, Cutters, Solders, & Braziers	51-4121
Inspectors, Testers, Samplers	51-9061
Packaging & Filling Machine Operators	51-9111

In addition to the above categories an additional category, i.e. Emerging Occupation, was developed for the Industrial Engineering Techs (SOC 17-3026). This was deemed necessary due to the changing nature of this occupation in an advanced manufacturing environment. This occupation remained after the first report as a "shortage" occupation based on the advice of many manufacturing employers and some EGR 10 Core team members from the manufacturing arena. As this occupation is transmogrifying new titles are being bestowed upon it such as Manufacturing Engineer, Industrial Engineering Technician, Engineering Technician, Project Engineer, Production Staff Worker, Process Documentation and Methods Analyst, Industrial Engineering Analyst, Tool Representative, Quality Process Engineer, Manufacturing Technician. It is for this reason that the original shortage/surplus estimates for this occupation likely underestimate the true size of the shortage. This occupation will certainly be a focal point for future workforce consideration.

In order to maintain an emphasis on logistics as it relates to manufacturing, truck drivers were not included in the prioritization process. For the remainder of the SSI project the focus will be placed on the occupations listed as Category 1. Even so, a careful eye will remain on the Category 2 occupations as prospects for addressing shortages in those areas may arise.

Root Cause Classification

Following SSI Methods and Guidance for the Root Causes Report, occupational shortage factors were looked for in the following areas:

6. Employer HR policies & practices
    a. Recruitment
    b. Supervision
    c. Inadequate HR capability
7. Education and training capacity and student/completion/placement
    a. Academic & other requirements for entry
    b. Duration of programs
    c. Cost & accessibility of programs
    d. Present & planned capacity for intake into programs
    e. Present & actual intake into programs
    f. Persistence rates and completion rates
    g. Program quality
8. Pipeline issues
    a. Career awareness
    b. Social perception
    c. Public education
    d. One-stop centers
9. Leakage
10. Wage rates & benefits

In order to provide consistency across all methods for primary data gathering, each method was designed with these areas as the foundation. Thus, the comparison of results across various methods is not only consistent but statistically appropriate. Further, a number of activities were undertaken by EGR 10 to ensure that our Consortium of employers had ample opportunity to participate in the Root Cause Analysis process.

Inclusion of Consortium

The Work Team continued to maintain a balance of Consortium participants from all sectors across all counties in EGR 10. Special attention was given to include those companies who had expressed interest and/or had participated in WorkOne and Southern 7 projects in the past, to ensure that those employers already engaged in workforce

development activities could serve as the core for further development of workforce partners in this initiative. Additionally, the Work Team noted those companies participating in Phase 2 activities that had maintained a strong project presence since the inception of SSI in order to be ready to quickly engage said companies in Phase 3 Solutions Development activities. Twenty-eight (28) companies participating in Phase 2 – Root Cause Analysis – activities included:

AFL-CIO LIFT
Amatrol, Inc.
Bruce Fox, Inc.
Cancer Care Center of Southern Indiana
Clark Memorial Hospital
Consolidated Grain & Barge
Daramic, LLC
Eagle Steel Products
FKI Security Group Inc.
Floyd Memorial Hospital
Frank Miller Lumber
Freudenberg NOK
Harrison County Hospital
Indiana University Southeast
Ivy Tech Community College
Jasper Engines
Jean's Extrusions
Key Electronics
Koetter Woodworking
L&D Mail Masters
Precision Automation
Scott County Econ. Dev. Corporation
Summitt Trucking
Tecumseh Power, Inc.
Total Concepts of Design
Tyson Foods Inc.
Washington Co. Econ. Growth Ptshp.
Washington County Hospital

Employer Interviews

One method by EGR 10 for data collection was through employer interviews. Members of the EGR 10 Work Team contacted employers in each of the Region's six counties and established interview times, dates and locations. Each interview was conducted using the same template, wherein the five key "discovery" areas for Root Cause Analysis were explained. Employers were asked to respond to ***internal influences***, i.e. HR Policies and Practices and Wages/Benefits Issues, first; then discussion ensued regarding ***external influences***, i.e. Education and Training Capacity & Leakage. Finally, the interviewer approached the Employee Pipeline issues for

discussion and reflection. Common themes discussed by interview participants included the following:

- Recruitment is very time consuming, expensive, and often difficult
- Lower wage jobs are the hardest to fill and have the greatest rates of turnover
- Hard to accomplish needed training in today's global economy
- Promotion mostly comes from within; supervisory training not a priority
- Companies are receiving little help from educational institutions to promote career opportunities in their industry
- Competition is present with Louisville; most companies recognize their place in the Greater Louisville 24-county labor shed
- Benefits are offered to ameliorate moderate to low wage rates

Employer Updates

Periodic updates were sent to employers and key players, either via e-mail or US mail to ensure that all participants were kept abreast of the project's progress and upcoming opportunities for employer engagement. An example of such an update mailed and/or emailed to Consortium members in December, 2005, is attached.

Root Cause Analysis Survey

Using Survey Monkey, a basic online survey design and distribution tool, the Work Team developed an instrument that directed the employer's survey experience depending upon their industry sector. The two tracks in survey design mirrored each other to provide consistency among survey respondents' experience. For those employers and key contacts whose e-mail address was available, surveys were distributed via Survey Monkey with an explanatory cover letter and the Southern 7 Workforce Investment e-mail as the identifying element to encourage participation. The survey was emailed to approximately 80 members of the Consortium (those for whom an email address was available). Of said respondents, 28% represented the Health Care industry

and 72% represented Manufacturing/Logistics. The survey was crafted using the five areas of focus for root cause analysis identified in the SSI Guidebook. The responses were as follows:

	Health Care	**Manufacturing/Logistics**
HR Policies and Practices	No issues to report	Supervisory training has much room for improvement.
Education & Training	Cost of training and intake capacity of programs are two most significant issues impeding business in EGR 10	Convenience of training programs is significant impediment to mfg. industry.
Employee Pipeline	No issues to report	Young people are somewhat unaware of opportunities in this industry; public education does not prepare students adequately to succeed in mfg.
Leakage	Health care employers in EGR 10 face stiff competition from Louisville for RNs	Some leakage to Louisville from companies in Corydon; otherwise not an issue.
Wages & Benefits	Consistent with other employers in industry	Consistent with others to more competitive
Other Information re: Causes	Burnout and stress are key factors leading to occupation shortages in health care.	Generational culture issues impacting workplace; nomadic tendencies of CDL drivers; wood species training needed; lean mfg leaves little time for training.

Focus Group: Root Cause Analysis

Employers met at Indiana University Southeast on Monday, December 12, 2005 from 9-11 a.m. to discuss the issues pertinent to Root Cause Analysis for critical occupations and skills in shortage in EGR 10. After introductions and a brief synopsis of the research that led to the selection of the industries included in this project, a ranking exercise was completed by participants to assist the Work and Core Teams in prioritizing the 19 occupations identified as critical and in shortage in Phase 1. Discussion occurred regarding the five key areas identified in the SSI Toolkit as being the most likely sources for root causes of shortages. The five areas are:

- HR Policies and Practices
- Wages & Benefits
- Education and Training Capacity
- Leakage
- Employee Pipeline Issues

HR Policies & Practices

Comments made regarding HR Policies and Practices and Wages/Benefits, the two areas of discussion which focused on internal factors, were as follows:

Recruitment

- Consulting Firm assistance for temporaries and professionals – is expensive but offers an internal time savings
- Production/Technical recruitment is conventional; use educational institutions
- For RNs advertising and health care recruiter; bonuses for RNs; hard to recruit PT and Pharmacy
- Using online recruitment company (Brass Ring) to screen applicants; also listing with Job Bank and Monster.com
- Advertising, walk-ins, word of mouth, Work One all methods of recruitment

Retention

- Management and Management Support have little turnover
- Production – High turnover; low skills; attendance; motivation; characteristics have been prevalent for a long period of time; little use of migrant workers
- Many production staff with high seniority are retiring; causes turnover rates to escalate
- Executive positions also tend to shift regularly due to stress, high intensity
- Health insurance premiums lower to entice employees to stay
- Lots of longevity in the WCMH
- Money doesn't appear to affect turnover rates
- Cost sharing with employees re: suggestions
- Different motivators for different age ranges; socioeconomic status
- Competition with Louisville for workers in Corydon

Supervision

- Good workers not necessarily the best supervisors
- Leap to management is difficult; try to promote from within
- Tuition reimbursement; seminars offered to train effective supervisors

HR Capacity

- Function in survival mode – what happens when HR staff person is absent?
- Employers reported approximately 1/100 ratio for HR capacity, except for one company with 75% turnover which has a 1.3/100 ratio
- Technology can sometimes hinder the HR Department's operations
- Use HR agencies periodically to increase capacity; online application/screening resources
- Work Keys Profiling is helpful, but can actually sometimes slow down bringing up a production line

Education & Training

Comments made regarding Education and Training Capacity and Leakages, the two areas of discussion which focused on external factors, were as follows:

- Training was offered internally about safety and hazardous materials.
- New training is provided as a reaction to a presenting need.
- Hard to find time for additional training in lean manufacturing environment (described as each employee having a primary function and a backup function)
- Much decision making is on the line; mentoring helps breed efficiency
- Tyson Leadership staff encouraged to participate in internal Leadership college; not mandatory; no incentives for completion
- Tuition reimbursement available but no time during work day to complete course work.
- Production staff receives one-on-one mentoring; supervisors also receive mentoring; monthly communication meetings held during which safety and other training are presented.
- Front line staff receive on-the-job training
- Training is a big part of retention – different jobs are assigned because of varying needs. Plant supervisors make these decisions
- Orientation – 2-3 hours, then to floor (plus safety and environmental training); at Tyson, 5 day orientation (20 hours) -1 full day training plus unit orientation
- CQI training no longer available – now offer luncheon quality programs
- Assistance with ISO implementation would be helpful
- Required leadership training for supervisors; skills certificate for Production
- Real gap in nursing from lack of qualified nursing educators; need community fund for MSNs to stay in Nursing Education
- Certification for maintenance and apprenticeship programs for key areas would help to encourage participation
- Employees don't want participate in additional training for no reward; also don't want to expend great deal of personal time.

Leakage Issues

- Geographic migration – one or two adjacent counties
- Leakage of RNs to Louisville

Pipeline Issues

Comments made regarding Employee Pipeline Issues were as follows:

- Work ethic was key – hard to train for this, results from family values
- Lack of part-time experiences; student intern programs makes transition to workplace difficult
- Perceptions of manufacturing are low – low class job
- School programs have all but eliminated industrial arts classes; emphasis from the Indiana Chamber of Commerce on Core 40 and college degrees rather than a balance of educational opportunities.
- Work One – helpful for hourly placements; screening and prioritizing needs to improve
- Current vocational programs need to be more closely aligned with the needs of the market – teaching applications that are not widely used in the industry anymore.

Worker Survey

To ensure that documentation collected was not representative of ONLY the employers' perspective regarding shortages and root causes, EGR 10 engaged Walker Information, Inc. to design and analyze two survey instruments that would collect information from 1) Health Care employees currently serving in occupations that have been identified as critical and in shortage OR feeder occupations that may be well-situated on the career path to an occupation in shortage; and 2) manufacturing employees currently serving in shortage occupations. Approximately 1000 surveys were distributed for both industries using a combination of e-mail delivery and direct delivery through HR departments. To date, preliminary data has been gathered for health care, which results were consistent with the health care remarks tallied from the employers' input methods.

The final report will be available in late January, 2006, so that it may be used to help craft solutions that are consistent with employer and employee demand.

Work Team Strategy Session

The Work Team, consisting of Ron McKulick - Southern 7 Workforce Investment, Alan Jay White - Indiana University Southeast, Thayr Richey - Strategic Development group, Inc., and Jennifer L. Wilcox - Jennifer Wilcox Consulting met on Wednesday, December 21, 2005, for a day-long work session to analyze and reflect upon the information collected to date, both from primary and secondary sources. Activities undertaken at this work session included:

1. Highlights and review of the cause mapping process;
2. Review and completion of cause grids for each targeted occupation. This involved assimilation of all references (primary and secondary) to a particular occupation, relative to the five "discovery" areas for Root Cause Analysis;
3. Development of preliminary cause maps for each shortage occupation;
4. Discussion of recommended prioritization of causes; and
5. Discussion of link between shortage occupations and skills crosswalk.

The purpose of this meeting was twofold: firstly, this meeting brought together all the work items that had been undertaken since early November for the purpose of better organizing said elements into the Phase 2 report; and secondly, this meeting established the agenda for the Core Team Meeting, scheduled for the following day.

Core Team Meeting

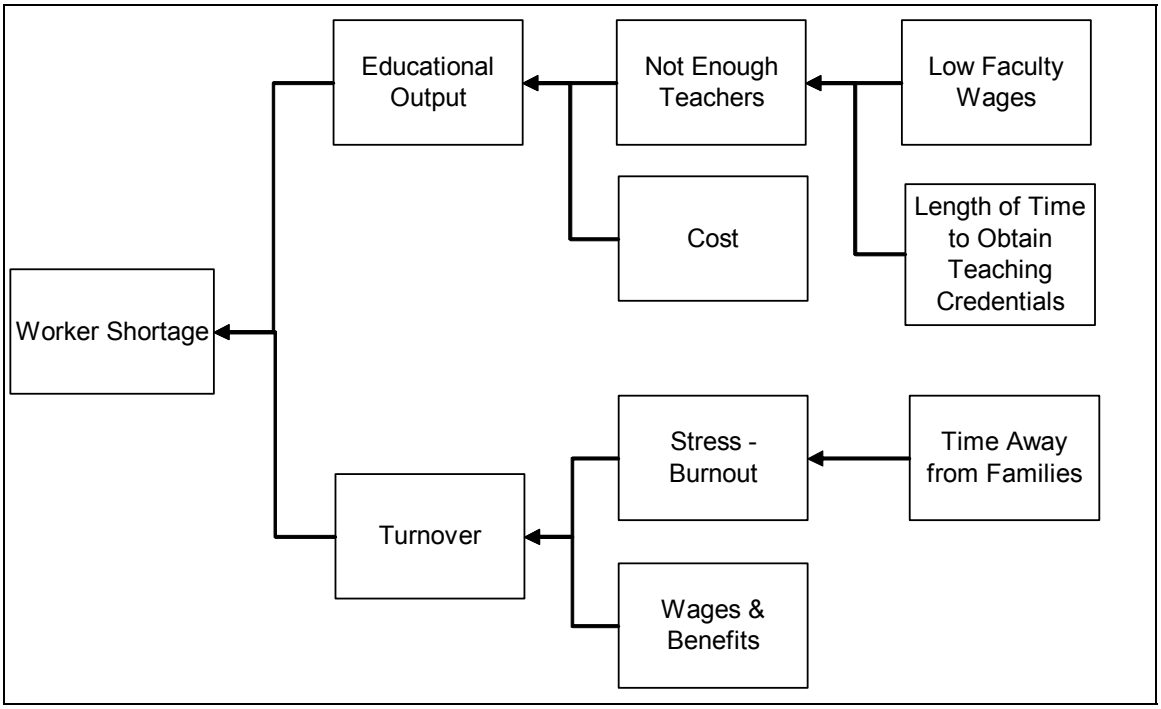
EGR 10's Core Team, consisting of representatives from educational institutions, labor, economic development, workforce investment, health care, manufacturing, and others, met on Thursday, December 22, 2005 to review the Work Team's progress, to make changes and additional recommendations to the Shortage Occupation cause maps, and to affirm the priority recommendations of the Work Team, based on their analysis of employer participation and feedback. Additionally, the Core Team was asked to offer their thoughts relative to the root causes with greatest impact on occupation shortages on an industry wide level. Upon hearing all information presented by the Work Team, the Core Team authorized the submission of the Phase 2 Report.

Cause Maps, Root Cause Ranking, & Shortage Sensitivity

The steps and tools in the root causes analysis process generated a great deal of data, both from primary and secondary sources as outlined above, and led to outlines for root causes and root cause rankings. This data was used to construct detailed cause maps for each occupation and to develop root cause rankings and sensitivities for each occupation. The cause maps and the root cause ranking tables developed are presented throughout this report in a manner that allows a reader a quick synopsis of the factors leading to worker shortages and the ranking of those factors.

In each map, as we move from left to right an attempt is made to answer the question "why?" Why does a shortage exist for this occupation? Answer: Because of educational output. Why is educational output a problem? Answer: Because of instructor shortages and cost. Why are there instructor shortages? Answer: Because of inadequate faculty wages and the time necessary to complete a program. A cause map example is provided below.

Figure 1: Worker Shortage Cause Map Example



After the root causes were determined, each cause was ranked relative to the other causes. A number was assigned to each cause to measure the impact of that cause on the worker shortage with a rank of 1 indicating the largest contributing factor. When two or more root causes were determined to have a similar impact on the shortage they were assigned the same rank.

Keeping the line-of-sight and the solutions phase in mind, a Solution Suitability Factor was established for each cause in an attempt to rank which, if any, of the contributing factors is appropriate for SSI funding. This is an early-estimation step in determining which causes are appropriate for targeting by workforce development system funds. This early-estimation does not preclude or ignore direct investment by employers or the availability or usage of other funds; these other resources are integral to real, long-term solutions. The ranking is simply an attempt to look, at a glance, at which root

causes may be more amenable to being addressed and resolved through the various SSI funds. Consequently, the ranking helps to indicate who exerts more control over the solvability of other root causes, such as the employer, a sector network, public policy/legislation ,etc.

The rankings are:

Solution Suitability Rank	Rank Meaning
1	There is a high likelihood that significant impacts can be made on the root cause and positively impact the occupational shortage through SSI funding. An example would be where dollars could go directly towards reducing the cost of training for employees or potential employees and would likely lead to a measurable desired outcome.
2	Opportunities for solution development are possible, but the positive impact appears less certain or possibly smaller than a 1 ranking.
3	Although solution development opportunities are possible, several factors/dynamics exist which could constrain the returns of SSI investment significantly.
4	This category indicates that the root cause is outside the locus of control (e.g. the aging population and some leakage situations) and therefore inappropriate for SSI funding.

Finally, sensitivities for each occupational shortage were determined. A section is provided for each occupation that discusses the potential impact on the shortage as certain root causes are addressed. An impact can be made, hopefully in a timely manner for some occupations with carefully designed solutions. Unfortunately for some occupations the root causes are so systemic and interrelated that a complex and resolute effort by multiple stakeholder will be required to curb long-term worker shortages.

HEALTHCARE

For EGR 10, the sector that experienced the largest job growth was Healthcare with an additional 988 jobs being created over the 2001 – 2004 time frame. Healthcare is the third largest employer in Region 10, responsible for 10.7% of the region's employment. The largest employers within the healthcare field are Hospitals and Ambulatory Health Care services and these two areas also have experienced the largest growth in employment.

In terms of total wages paid, ranked second in EGR 10 behind Manufacturing. It is also true that a number of occupations within the healthcare field offer good wages and benefits. High paying jobs can enhance living standards and help balance local and state budgets through the resulting higher tax revenues.

Projections at the national and state level are for this sector to continue to grow and a number of occupations are in shortage or are projected to be in shortage. Four areas of concern nationwide are Registered Nurses, Certified Nursing Aids, Radiology Technologists and Respiratory Therapists.

Although there are a number of reasons for continued growth in this sector, the primary cause is the aging population. As the baby boom generation approaches and begins retirement over the next few years and as life expectancies increase, the demand for healthcare services will increase. Simultaneously as many in the healthcare sector retire along with their brethren in other sectors a squeeze will be placed on supply-side of the equation. In addition, females, one of the primary demographics historically drawn to

the healthcare field, now have more opportunity and options available to them as career choices further limiting the supply of healthcare workers.

In the original Occupation and Skills Shortage Report eight critical occupations were projected to be in shortage. Those eight occupations were later pared to three outlined below:

Category 1 – Healthcare

Occupation	SOC
Registered Nurses	29-1111
Laboratory Technicians (Medical & Clinical)	29-2012
Respiratory Therapists	29-1126

Median salaries, benefits, projected job growth and projected short-run and long-run shortages are provided in Table 1 below.

Table 1: Critical Healthcare Occupation Wage, Benefit, and Shortage Estimates

HEALTHCARE PRIMARY TARGET OCCUPATIONS						
					Projected Shortage	
Occupation	Median Salary	Average Annual Benefits	# of Jobs 2002	% Growth 2002-2012	2007	2012
Registered Nurses	$50,000	$15,128	2,092	27%	79	116
Medical and Clinical Laboratory Technicians	$28,970	$9,229	115	16%	16	40
Respiratory Therapy	$40,200	$10,416	26	34%	27	12

Sources: Kentuckiana Occupational Outlook (benefits) & Bureau of Labor Statistics, Occupational Employment Statistics Survey

Over the next few sections, details regarding the causes for the shortages for each of the above occupations will be outlined. The majority of the discussion will focus on Registered Nurses, but many of the issues are also relevant to Respiratory Therapists and other fields within healthcare.

Registered Nurses

Arguably, more ink has been spilled and more trees have been sacrificed regarding shortages of Registered Nurses (RNs) than any other occupation. Nursing has been studied comprehensively at both the national and state level. It should come as no surprise then that this report will have more to say about the nursing shortage than any of the other occupations targeted. Furthermore many of the issues contributing to the nursing shortage also contribute to shortages in other healthcare occupations including respiratory therapy. Nursing shortages are nothing new and the United States has experienced a shortage of nurses during the decades of the 50's, 70s, 80s, and this most recent crisis at the beginning of the new millennium. Nationwide, the primary reasons for the current and projected nursing shortage are:

1. Low satisfaction with current working conditions leading to burnout and job dissatisfaction.
2. Nursing school enrollments and graduation rates are insufficient to meet projected demand.
3. Aging nursing population. A large number of nurses are currently in their 40s and nurses tend to retire in their 50s. After the year 2010 we will begin to see significant numbers of baby boomers retire and increasing healthcare demands at a time when nurses are retiring and the potential pool of new nurses becomes smaller.

Of course some of these factors are inter-related. Higher job dissatisfaction leads to more nurses leaving the field to pursue alternatives or by encouraging early retirement.

This further increases workloads and job-stress as patient-to-nurse ratios increase causing a continued deterioration in job satisfaction and a continued exodus of nurses. Publicly available information on these issues reduces the image status of a nursing career which limits enrollments. It's a vicious cycle. Even if you increase the number of nursing graduates, a large number will continue to leave the field if the satisfaction issue is not addressed.

The Supply of Registered Nurses

The good news is that there have been steady increases in output from nursing schools nationwide over the past five years. According to a 2005 survey by the American Association of Colleges of Nursing (AACN), the number of graduates from the nation's baccalaureate and graduate degree programs increased by 19.1 percent from 2004 to 2005 and enrollments in those programs increased 13%. The bad news is that more than 30,000 qualified applicants were turned away due primarily to insufficient faculty, limited clinical placement sites, and classroom space.[1] For EGR 10 there has not been a significant increase in BSN output from IUS for the past several years due to resource constraints, primarily in terms of faculty. Qualified applicants for IUS's BSN are frequently turned away although exact numbers were unavailable at the time this report was being completed.

Lack of Qualified Faculty

A primary reason for the educational crunch nationwide is the lack of qualified faculty. According to an AACN survey (March 15, 2005), seventy-five percent of

[1] American Association of Colleges of Nursing (AACN) Referral source: http://www.aacn.nche.edu/media/NewsReleases/2005/enrl05.htm

reporting nursing schools cited a lack of qualified faculty as the primary reason for turning away qualified applicants.[2] Reasons for the faculty shortage include: (1) individuals with the credential to teach often have alternative opportunities; (2) the wages/benefits associated with teaching are relatively low; (3) there are fewer younger faculty coming into the ranks; and (4) many of the existing faculty are retiring or are approaching retirement.

Faculty salaries are likely one of the largest contributors the shortage of nursing instructors. Nursing instructors typically earn less and have less salary growth potential than their colleagues who hold clinical jobs.[3] Nurses can earn more in clinical practice with a master's degree than in a faculty position that may require a doctoral degree. [26] Starting salaries for new graduates may exceed salaries of faculty who have both advanced degrees and experience.

A contributing factor to the faculty shortage may be related to the number of students who choose to pursue an Associates degree (ASN) versus a baccalaureate. Many states promoted community college efforts to alleviate past nursing shortages, including Indiana. The resulting output of RNs with associate degrees has been successful in reducing the size of the deficits. RN's with different degrees (associates, baccalaureate, and some masters) all receive the same licenses. There is no significant difference in salary and benefits across the different degrees once experience and other factors are accounted for. In many states, such as Indiana, an ASN can be obtained in 3 years or less whereas a BSN requires four years. The reduced cost (in terms of both

[2] AACN. (March 15, 2005. Fact Sheet: Nursing faculty shortage. Referral source: http://www.aacn.nche.edu/Media/FactSheets/NursingFacultyShortage.htm
[3] HRSA Report - Nursing Education in Five States: 2005. Referral source: http://www.bhpr.hrsa.gov/healthworkforce/reports/nurseed/intro.htm

opportunity costs and tuition) makes the ASN a very attractive option for potential nurses.

The trend for EGR 10 and for Indiana regarding educational attainment is running counter to what's occurring nationally. The Health Resources and Services Administration's (HSRA) 2004 survey of RNs, found that the highest increase from 2000 to 2004 was for the number of RNs receiving their master's or doctorate degrees (an estimated increase of 101,978 RNs or 37 percent).[4] Conversely, Indiana University SE is producing fewer RNs than it did just five years ago and the growth in MSNs and Doctoral nursing degrees has increased only about 1 percent for the entire Midwest.[5]

So why is the decline in BSN degrees a potential problem for EGR 10? The problem is that fewer BSNs mean fewer MSNs which mean a smaller pool of qualified individuals who can teach. As existing nursing faculty retire there will be fewer qualified individuals available to replace them. This will impact both associate and baccalaureate degree programs by further constraining the supply of teachers. As access to education is constrained healthcare costs will be impacted as will quality of service. Finally, there is some evidence that BSN graduates bring unique skills to their work as nursing clinicians and play an important role in the delivery of safe patient care.[6]

While ASNs appear to have been an effective stop gap measure in getting RNs in the field, there are two reasons to encourage people with ASN degrees to get their

---

[4] HRSA 2004 Survey of RNs, summary findings. Referral Source: http://www.bhpr.hrsa.gov/healthworkforce/reports/rnpopulation/preliminaryfindings.htm#edprep

[5] HRSA Report - Nursing Education in Five States: 2005. Referral source: http://www.bhpr.hrsa.gov/healthworkforce/reports/nurseed/intro.htm

[6] AACN. (March 15, 2005. Fact Sheet: Nursing faculty shortage. Referral source: http://www.aacn.nche.edu/Media/FactSheets/impactednp.htm
A full discussion of the ASN versus BSN debate would likely be more appropriate as we approach the solutions phase. In the meantime, the interested reader can view a summary of the issues by referencing the provided AACN link.

bachelors: (1) It will lead to a larger pool of individuals who are qualified to move on to the next step (masters or doctorate); and (2) it will increase the professional skills of RNs practicing in EGR 10 and Indiana.

Lack of Clinical Sites

A lack of clinical sites is often credited for exacerbating the educational logjam for RNs. This problem is especially acute in EGR 10 causing many students to seek clinical opportunities in Louisville. Many of those students do not return to EGR 10 with as many as forty percent (40%) of our nursing graduates ultimately taking jobs in Kentucky.

Alternative Opportunities

According to Berliner and Ginzberg (2002), as recently as thirty years ago the majority of women in the workforce chose careers in education or nursing[7]. Over the past three decades or longer, more women began seeking careers in business or law or some other profession. In addition, many hospital nurses are choosing to become nurse practitioners in order to increase their wages. These expanded opportunities for the traditional nursing demographic have the potential to reduce the number of individuals who pursue a nursing career. Although more men are entering the field today than thirty years go there is not enough of an increase to offset the loss of women in the field. Potential solutions to this issue will likely involve increasing the attractiveness of the field to all potential entrants, including men and historically underrepresented minorities.

[7] Berliner, Howard S, and Ginzberg, Eli, "Why This Hospital Nursing Shortage is Different," *Journal of the American Medical Association (JAMA)*, Dec. 2002, Vol. 288, No 21, pp 2742 – 2744.

Early Retirement

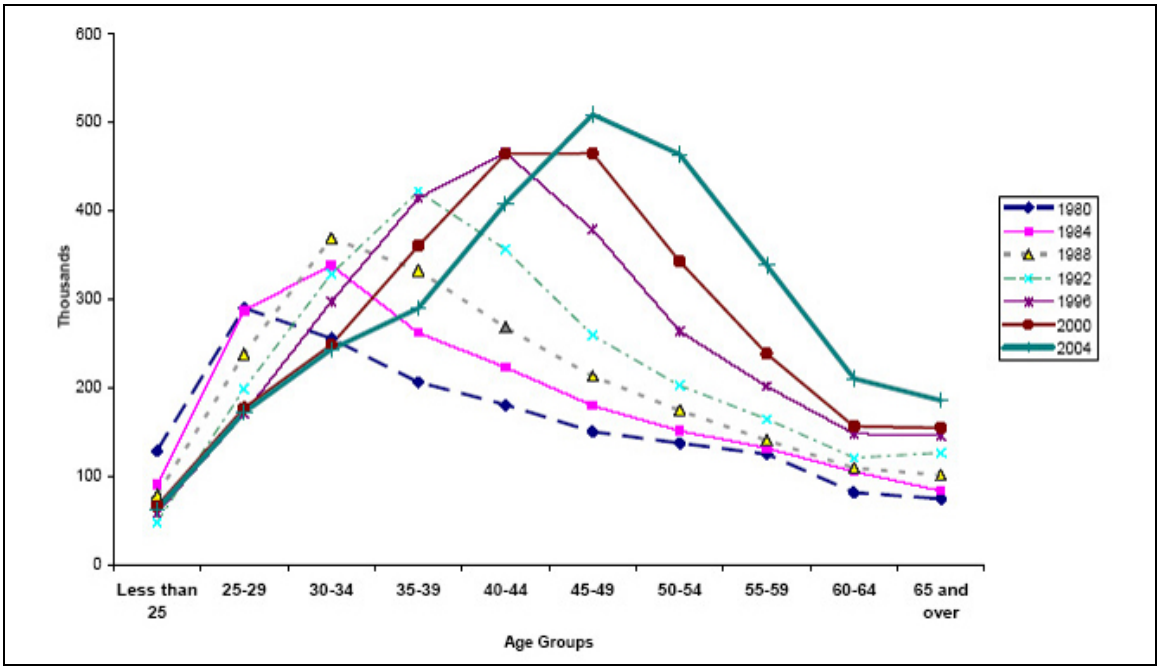
Early retirement is also cited by Berliner and Ginzberg (2002) as a contributing factor to the nursing shortage[8]. Nurses tend to retire in their mid to late 50s as their children mature and the financial incentive to remain in the workforce is reduced. In addition, the physical demands of the job become more burdensome for older nurses.

Age

In March 2004, the average age of the RN population was estimated to be 46.8 years of age according to the HRSA survey.[9] This is approximately four years older than a decade ago. Equally troubling is the age distribution as shown in Figure 2 below. The RN population under age 30 has steadily dropped over the past several years. The percentage of the RN population under age 30 was estimated at 9.1 percent in 2000 as compared with 8.1 percent in 2004. At the same time, the percent of nurses over 54 years of age has increased. The online survey conducted for EGR 10 indicate that the largest age cohort for RNs is the 45 – 54 age group (35% of respondents), followed by the 35 – 44 age group (33% of respondents).

[8] Ibid. 2744.
[9] HRSA 2004 Survey of RNs, summary findings. Referral Source: http://www.bhpr.hrsa.gov/healthworkforce/reports/rnpopulation/preliminaryfindings.htm#edprep

Figure 2: Age Distribution - Registered Nurses



Source: HRSA 2004 Survey of RNs, summary findings.
http://www.bhpr.hrsa.gov/healthworkforce/reports/rnpopulation/preliminaryfindings.htm#edprep

Working Conditions and Job Dissatisfaction

A common saying in the nursing profession is "Nurses love their work but hate their jobs."[10] Aiken et al (2000) found that forty percent of hospital nurses are dissatisfied with their jobs in a study of nurses in five countries.[11] The study further reports that one out of every three nurses under the age of 30 planed to leave the profession within a year. Job dissatisfaction for hospital nurses is four times greater than that for other U.S. occupations, and 1 in 5 hospital nurses report that they intend to leave their current jobs within a year for reasons other than retirement.[12]

[10] Ibid. 2742
[11] Aiken, Linda H., Clark, Sean P., et al. "Nurses' Reports on Hospital Care in Five Countries," *Health Affairs*, 2001 v(20). pp. 43-53.
[12] Ibid.

A primary cause of this dissatisfaction has to do with staffing levels. Aiken et al (2002) reported finding higher emotional exhaustion and greater job dissatisfaction in nurses was strongly and significantly correlated to patient-to-nurse ratios. Nurses at hospitals with 8:1 patient-to-nurse ratios were 2 times as likely as nurses with 4:1 patient-to-nurse ratios to show high emotional exhaustion and were also twice as likely to express job dissatisfaction.[13]

More troubling than dissatisfaction are potential healthcare errors due to exhaustion and handling too many cases. Aiken (2002) found that in hospitals with high patient-to-nurse ratios, surgical patients experience higher mortality rates.[14] The odds of patient mortality increased by 7% for every patient added to the average nurse's care. The difference from 4 to 6 patients and from 4 to 8 patients increased the odds of patient death by 14% and 31%, respectively.

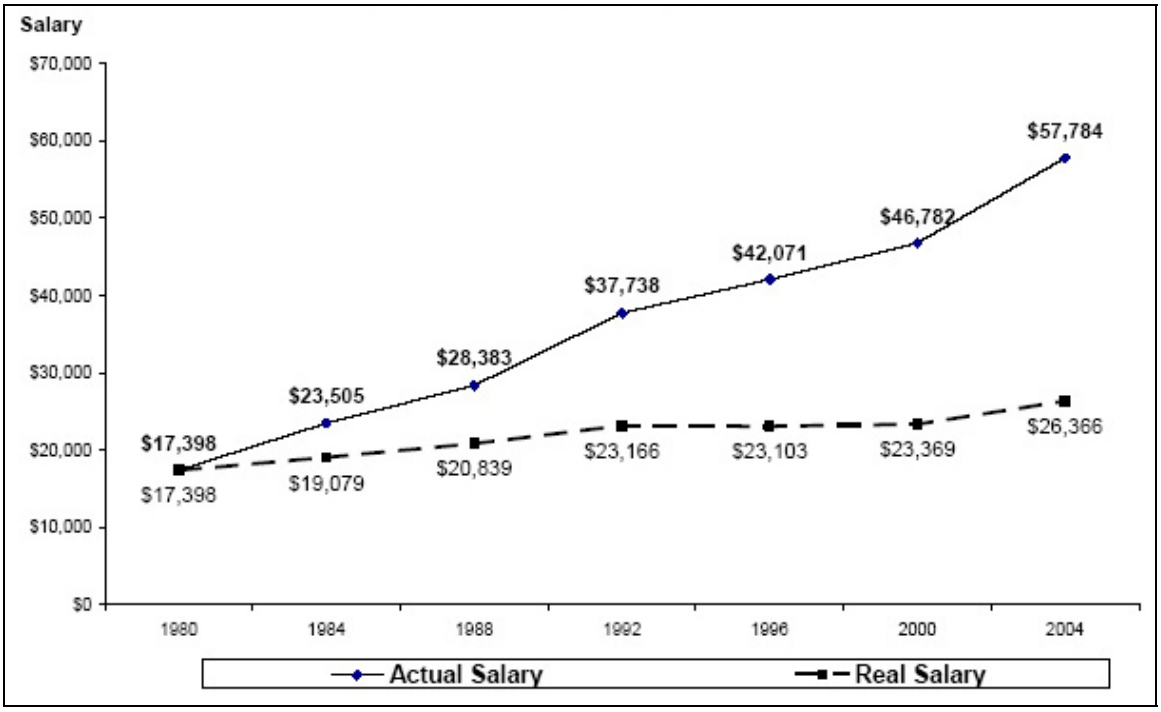
Wages and Benefits

Although wages are likely a contributing factor to the shortage of teaching faculty they may not be as large a factor for practicing nurses. The 2004 HRSA survey of RNs shows that while real earnings have been relatively flat throughout the decade of the 90s, there has been an increase over the period 2000 – 2004. The growth in earnings and real earnings for RNs is shown in Figure 3 below. On the other hand, if you include non-pecuniary items such as staffing issues and scheduling as benefits, it is entirely likely that there has been a decline in perceived "real" benefits. This observation is born out on the data relating to job satisfaction.

---

[13] Aiken, Linda H., Clark, Sean P., et al. "Hospital Nurse Staffing and Patient Mortality, Nurse Burnout, and Job Dissatisfaction," *Journal of the American Medical Association*, Oct., 2002, Vol. 288, No 16, pp. 1987 – 1993.
[14] Ibid. 1991.

Figure 3: Salary Growth - Registered Nurses



Source: HRSA 2004 Survey of RNs, summary findings.
http://www.bhpr.hrsa.gov/healthworkforce/reports/rnpopulation/preliminaryfindings.htm#edprep

Average wages for RNs in the Louisville MSA are higher than those for Indiana and Kentucky and are comparable to other MSAs including Indianapolis and Cincinnati. There is some evidence that salaries in Clark and Floyd counties may be higher than the remaining EGR 10 counties which could impact intra-regional migration. Hourly and annual salary data for RNs is provided in Table 2 below. It seems likely that while higher wages would initially attract more entrants into the field, it would not be enough to keep them in the profession.

Table 2: Salary Data - Registered Nurses

Location	Pay Period	10%	25%	Median	75%	90%
United States	Hourly	$17.51	$20.32	$24.53	$29.41	$35.11
	Yearly	$36,400	$42,300	$51,000	$61,200	$73,000
Indiana	Hourly	$15.66	$18.70	$21.64	$25.56	$28.93
	Yearly	$32,600	$38,900	$45,000	$53,200	$60,200
Kentucky	Hourly	$14.71	$16.73	$19.59	$22.46	$25.74
	Yearly	$30,600	$34,800	$40,700	$46,700	$53,500
Louisville, KY-IN, MSA	Hourly	$18.26	$20.58	$24.04	$27.61	$32.15
	Yearly	$38,000	$42,800	$50,000	$57,400	$66,900

Source: Bureau of Labor Statistics, Occupational Employment Statistics Survey. Salary information is for 2003.

Leakage

Leakage appears to be a significant contributing factor to EGR 10's nursing shortage. As many as forty percent (40%) of nursing graduates from Ivy Tech in Sellersburg and Indiana University SE are ultimately licensed as RNs in Kentucky. While this may be do to some wage issues it is likely primarily due to the fact that many of the students perform their clinicals in Louisville hospitals.

Within EGR 10, wage differentials do contribute to cross county migrations of RNs. The drive to Clark or Floyd County is not onerous for someone living in the surrounding counties. This makes it difficult for healthcare providers in Crawford, Harrison, Scott and Washington counties to attract and keep RNs. There also tend to be better and more modern facilities in Clark and Floyd Counties along with increased opportunities for training.

Finally, many nurses choose to leave the field voluntarily. Once employed in the field many find the stress and working conditions such that they choose pursue other occupations or simply leave the workforce entirely.

Additional research

An additional resource regarding the nursing shortage that contains detailed pipeline issues for five states (California, Georgia, **Indiana**, Texas & Utah) and was compiled by the Health Resources and Services Administration (HRSA). In addition the report summarizes and examines the strategies these States are pursuing to address the nursing shortage – issues that many of the EGRs may find useful as they develop solutions. This resource is available online at http://www.bhpr.hrsa.gov/healthworkforce/reports/nurseed/intro.htm

Sensitivity

The root causes for the nursing shortage are summarized in a cause map in Figure 4 below. Increasing nursing wages, while desirable, will not be sufficient to curb the nursing shortage. This strategy is necessary and would attract new entrants into the field but the other causes must be addressed to stem attrition. Furthermore, even if new entrants are attracted to nursing staffing shortages at educational sites would lead to qualified entrants being turned away.

Root causes are ranked in Table 3. The stressful work environment and limited access to education are the primary factors for the shortage. Most of the factors are interrelated and therefore multiple causes will have to be targeted before any real progress can be made regarding this occupation.

Figure 4: Shortage Cause Map - Registered Nurses

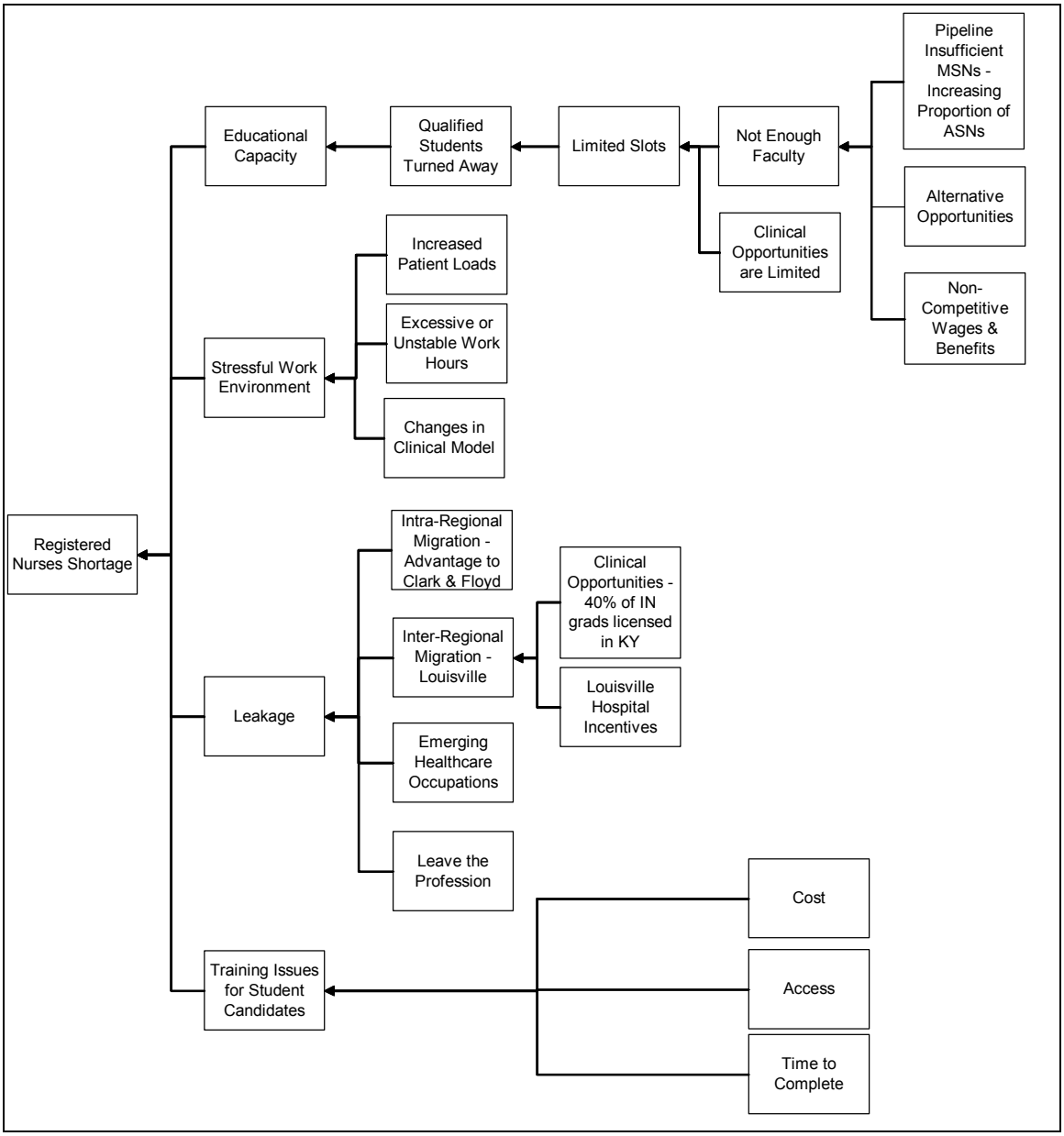


Table 3: Root Cause Ranking – Registered Nurses

Root Cause and Potential Solution Impact Ranking: Registered Nurses		
Root Cause	**Relative Importance/Impact[a]**	**SSI Solution Suitability Factor (Line of Sight)[b]**
Educational Capacity	1	3
Stressful Work Environment	**2**	**2**
Leakage	3	4
Training Issues for Student Candidates	4	**1**

[a] For the relative importance/impact column a lower number indicates a greater impact on the shortage with a rank of 1 indicating the largest contributing factor. When two or more root causes have the same ranking their impact was determined to be equivalent.

[b] Keeping the line of sight and the solutions phase in mind, the third column (SSI Solution Suitability Factor) is an attempt to rank which, if any, of the contributing factors is appropriate to address directly with SSI funding. This is an early-estimation step in determining which causes are appropriate for targeting by workforce development system funds. This early-estimation does not preclude or ignore direct investment by employers or the availability or usage of other funds; these other resources are integral to real, long-term solutions. The ranking is simply an attempt to look, at a glance, at which root causes may be more amenable to being addressed and resolved through the various SSI funds. Consequently, the ranking helps to indicate who exerts more control over the solvability of other root causes, such as the employer, a sector network, public policy/legislation ,etc.

The rankings are:

1. There is a high likelihood that significant impacts can be made on the root cause and positively impact the occupational shortage through SSI funding. An example would be where dollars could go directly towards reducing the cost of training for employees or potential employees and would likely lead to a measurable desired outcome.
2. Opportunities for solution development are possible, but the positive impact appears less certain or possibly smaller than a 1 ranking.
3. Although solution development opportunities are possible, several factors/dynamics exist which could constrain the returns of SSI investment significantly.
4. This category indicates that the root cause is outside the locus of control (e.g. the aging population and some leakage situations) and therefore inappropriate for SSI Funding.

Laboratory Technicians (Medical & Clinical)

As with other healthcare occupations, workforce shortages can impact care resulting in more mistakes, higher healthcare costs, and reduced service. The primary causes for shortages in this field are: (1) Career Ladder/Matrice issues; (2) Wages and benefits that are insufficient for a family; and (3) Certification is required.

Career Ladder

Many employees in this occupation are in the 35 – 54 age bracket and mobility options are limited. Some choose to further their educations in order to move into other occupations, often within the healthcare field. Furthermore, shortages have lead to overwork, stress and burnout which encourages migration out of the field.

Wages & Benefits

Wage data for this occupation is shown in Table 4. Although wages for EGR 10 seem to be competitive with other areas and MSAs, the overall level is too low to support a family. The relatively low wages combined with the age of many in this field is a major contributing factor to the shortage.

Certification

Certification by itself would not ordinarily be an issue. However the relatively low wages make the payoff hardly worth the efforts to become certified.

Sensitivity

The cause map for this occupation and root cause rankings are shown in Figure 5 and Table 5 on the following pages. Although better wages would certainly help with the shortage, additional efforts to assist with certification and additional training or resources for training would likely prove fruitful. Assistance with training for other areas would

make this occupation more attractive by creating more options and making it part of a career lattice or matrix.

Table 4: Salary Data - Laboratory Technicians

Location	Pay Period	10%	25%	Median	75%	90%
United States	Hourly	$9.57	$11.70	$14.49	$17.73	$21.58
	Yearly	$19,900	$24,300	$30,100	$36,900	$21.58
Indiana	Hourly	$9.34	$11.01	$13.40	$16.74	$20.22
	Yearly	$19,400	$22,900	$27,900	$34,800	$42,100
Kentucky	Hourly	$10.50	$12.19	$14.48	$17.01	$44,900
	Yearly	$21,800	$25,400	$30,100	$35,400	$19.89
Louisville, KY-IN, MSA	Hourly	$10.06	$11.69	$14.21	$17.73	$41,400
	Yearly	$20,900	$24,300	$29,600	$36,900	$20.55

Source: Bureau of Labor Statistics, Occupational Employment Statistics Survey. Salary information is for 2003.

Figure 5: Shortage Cause Map - Medical Laboratory Technicians

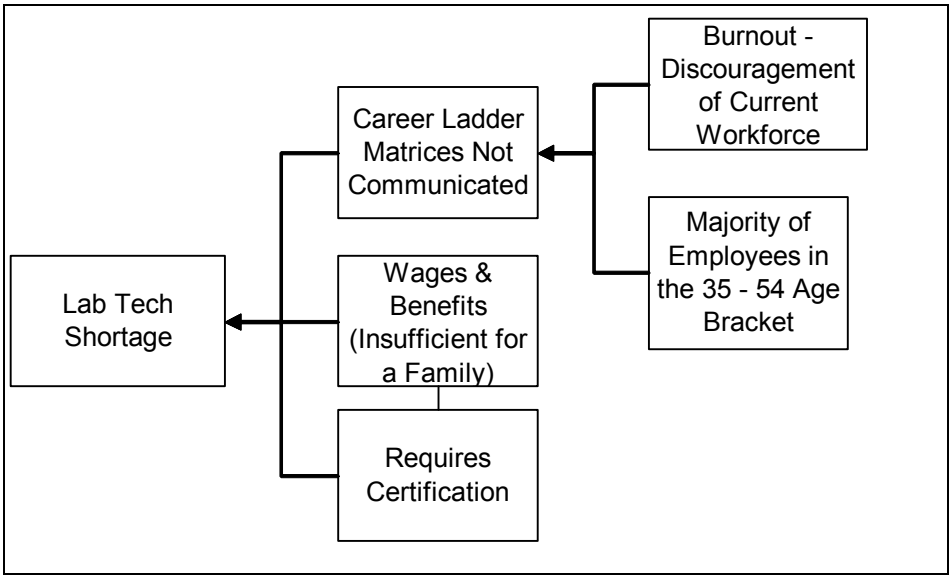


Table 5: Root Cause Ranking – Laboratory Technicians

Root Cause and Potential Solution Impact Ranking: Laboratory Technicians (Medical & Clinical)		
Root Cause	**Relative Importance/Impact[a]**	**SSI Solution Suitability Factor (Line of Sight)[b]**
Career Ladder/Matrices Not Communicated	**1**	**2**
Wages & Benefits (Insufficient for a family)	**1**	4
Requires Certification	2	3

[a] For the relative importance/impact column a lower number indicates a greater impact on the shortage with a rank of 1 indicating the largest contributing factor. When two or more root causes have the same ranking their impact was determined to be equivalent.

[b] Keeping the line of sight and the solutions phase in mind, the third column (SSI Solution Suitability Factor) is an attempt to rank which, if any, of the contributing factors is appropriate to address directly with SSI funding. This is an early-estimation step in determining which causes are appropriate for targeting by workforce development system funds. This early-estimation does not preclude or ignore direct investment by employers or the availability or usage of other funds; these other resources are integral to real, long-term solutions. The ranking is simply an attempt to look, at a glance, at which root causes may be more amenable to being addressed and resolved through the various SSI funds. Consequently, the ranking helps to indicate who exerts more control over the solvability of other root causes, such as the employer, a sector network, public policy/legislation ,etc.

The rankings are:

1. There is a high likelihood that significant impacts can be made on the root cause and positively impact the occupational shortage through SSI funding. An example would be where dollars could go directly towards reducing the cost of training for employees or potential employees and would likely lead to a measurable desired outcome.
2. Opportunities for solution development are possible, but the positive impact appears less certain or possibly smaller than a 1 ranking.
3. Although solution development opportunities are possible, several factors/dynamics exist which could constrain the returns of SSI investment significantly.
4. This category indicates that the root cause is outside the locus of control (e.g. the aging population and some leakage situations) and therefore inappropriate for SSI Funding.

Respiratory Therapists

The demand for respiratory therapists (RTs) is likely to increase for the same reasons as cited for registered nurses, namely the aging population. Respiratory therapists evaluate and treat patients who are suffering from respiratory illnesses and other cardiopulmonary problems and these problems are acute with the elderly. In addition to the aging population there seems to be an increase in respiratory illnesses in our region possibly related to high air pollution levels in the Louisville MSA and a relatively high incidence of smoking.

Although a new RT program has started at Ivy Tech in Sellersburg, it will take a little more time before we begin to see graduates from that program. Even with the new program, the existing educational output is not adequate to stem the shortage of RTs. The primary reasons for the current and projected shortage with RTs are:

1. Education Program Output.
2. Leakage to Louisville and from hospitals.
3. Burnout and travel.

Salary is not likely a major contributing factor for the shortage in RTs for Region 10. Salary data for RTs is provided in Table 6 below. The median salary for the Louisville MSA (which includes EGR 10 counties) was $40,200 in 2003 and this is close to the national figure. This salary is similar to the Indianapolis and Cincinnati MSAs and compares favorable with other healthcare occupations requiring a similar amount of education or training.

Although the Louisville MSA data is aggregated, there is some evidence that salaries may be higher in Louisville compared to the Indiana counties and there is some difference throughout the counties within EGR 10 with the salary advantage going to Clark and Floyd counties.

Table 6: Salary Data - Respiratory Therapists

Location	Pay Period	10%	25%	Median	75%	90%
United States	Hourly	$15.10	$17.55	$20.22	$23.58	$27.15
	Yearly	$31,400	$36,500	$42,100	$49,000	$56,500
Indiana	Hourly	$14.93	$17.07	$19.37	$21.58	$25.44
	Yearly	$31,100	$35,500	$40,300	$44,900	$52,900
Kentucky	Hourly	$13.71	$15.61	$18.24	$20.67	$22.84
	Yearly	$28,500	$32,500	$37,900	$43,000	$47,500
Louisville, KY-IN, MSA	Hourly	$15.34	$17.45	$19.32	$21.23	$24.22
	Yearly	$31,900	$36,300	$40,200	$44,200	$50,400

Source: Bureau of Labor Statistics, Occupational Employment Statistics Survey. Salary information is for 2003.

Educational Output

While capacity exists at Ivy Tech in Sellersburg for more students, current enrollments are low. Furthermore, as the program is new, we do not have information regarding attrition rates. Low enrollments are most likely due to:

- Awareness of the occupation and educational opportunities appears to be limited.
- Pipeline issues. An RT is highly specialized, especially compared with other healthcare occupations such as RNs. This potentially limits career paths and options for the RT.

- Program rigor. The rigor of an RT program would be comparable to that of an ASN. Some states experience attrition rates of up to 30% due to academic and financial reasons.[15]

Leakage

As with nursing, leakage to the Louisville is a factor for this occupation in EGR 10. Hospitals also face shortages as RTs have options available with other healthcare providers in the region.

Burnout & Travel

As the shortage for this occupation persists, overwork and staffing issues lead to stress and burnout. This reduces the relative attractiveness of the occupation and reduces the perceived "real" income generated. Many RTs also work in a journeyman fashion requiring a good bit of travel as they ply their trade to multiple healthcare service providers in the EGR.

Sensitivity

This is a field where significant gains can be made by increasing awareness of the program. Many potential candidates simply are not aware of this occupation as a career choice and are not aware of the RT program at Ivy Tech. A larger population of graduates will alleviate the staffing problems associated with this field. The cause map and ranking of root causes are provided in Figure 6 and Table 7 on the next two pages.

[15] North Carolina – State of Allied Health Report – Respiratory Therapists, August 2004. Reference Source: http://www.shepscenter.unc.edu/hp/resptherapy04.pdf .

Figure 6: Shortage Cause Map - Respiratory Therapists

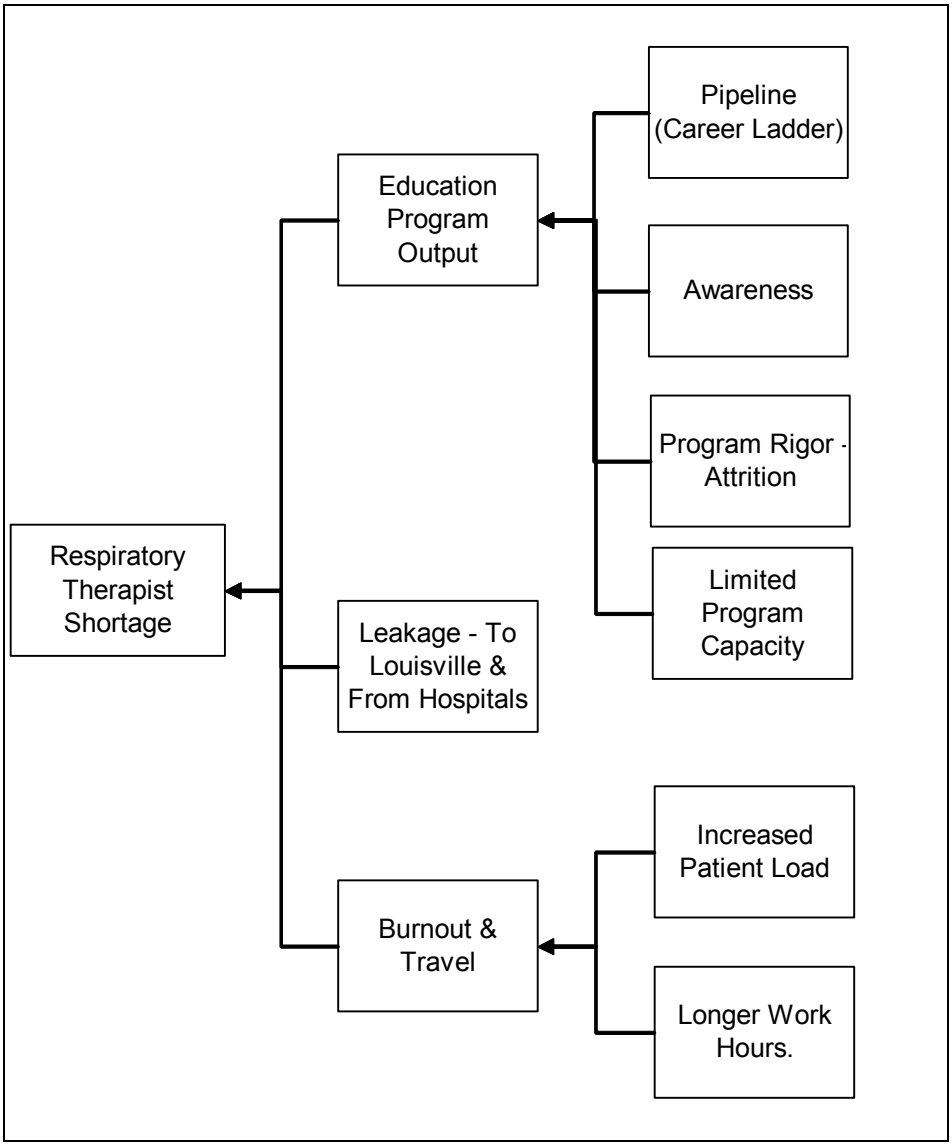


Table 7: Root Cause Ranking – Respiratory Therapists

Root Cause and Potential Solution Impact Ranking: Respiratory Therapists		
Root Cause	**Relative Importance/Impact[a]**	**SSI Solution Suitability Factor (Line of Sight)[b]**
Education Program Output	**1**	**2**
Leakage – To Louisville & From Hospitals	**2**	4
Burnout & Travel	3	**2**

[a] For the relative importance/impact column a lower number indicates a greater impact on the shortage with a rank of 1 indicating the largest contributing factor. When two or more root causes have the same ranking their impact was determined to be equivalent.

[b] Keeping the line of sight and the solutions phase in mind, the third column (SSI Solution Suitability Factor) is an attempt to rank which, if any, of the contributing factors is appropriate to address directly with SSI funding. This is an early-estimation step in determining which causes are appropriate for targeting by workforce development system funds. This early-estimation does not preclude or ignore direct investment by employers or the availability or usage of other funds; these other resources are integral to real, long-term solutions. The ranking is simply an attempt to look, at a glance, at which root causes may be more amenable to being addressed and resolved through the various SSI funds. Consequently, the ranking helps to indicate who exerts more control over the solvability of other root causes, such as the employer, a sector network, public policy/legislation ,etc.

The rankings are:

1. There is a high likelihood that significant impacts can be made on the root cause and positively impact the occupational shortage through SSI funding. An example would be where dollars could go directly towards reducing the cost of training for employees or potential employees and would likely lead to a measurable desired outcome.
2. Opportunities for solution development are possible, but the positive impact appears less certain or possibly smaller than a 1 ranking.
3. Although solution development opportunities are possible, several factors/dynamics exist which could constrain the returns of SSI investment significantly.
4. This category indicates that the root cause is outside the locus of control (e.g. the aging population and some leakage situations) and therefore inappropriate for SSI Funding.

Healthcare Summary

Root Cause and Potential Solution Impact Ranking Healthcare Occupations		
Root Cause	**Relative Importance/Impact[a]**	**SSI Solution Suitability Factor (Line of Sight)[b]**
Respiratory Therapists		
Education Program Output	**1**	**2**
Leakage – To Louisville & From Hospitals	**2**	4
Burnout & Travel	3	**2**
Registered Nurses		
Educational Capacity	1	3
Stressful Work Environment	**2**	**2**
Leakage	3	4
Training Issues for Student Candidates	4	**1**
Laboratory Technicians		
Career Ladder/Matrices Not Communicated	**1**	**2**
Wages & Benefits (Insufficient for a family)	**1**	4
Requires Certification	2	3

Although the nursing profession gets the most attention, numerous healthcare occupations are in shortage nationwide. For our region there are at least eight critical occupations in various degrees of shortage. The most critical are the three examined here: Registered Nurses, Respiratory Therapists, and Laboratory Technicians.

While numerous factors are responsible for these shortages, the overriding causes for the industry as a whole have to do with the aging population, staffing issues (which lead to overwork and stress), educational constraints, and in some cases wages and benefits.

These shortages exacerbate already stressful conditions and increase turnover for many occupations. If they are not addressed the likely outcome will be higher healthcare costs and/or reduced services. In the extreme, shortages in healthcare occupations lead to misdiagnosis, errors in treatment, and death. Most would agree that these issues are far more important than cost.

Although there are some ready solutions for certain occupations, many of the contributing factors to healthcare shortages are pervasive and interrelated. Addressing just one of the causes (wages for example) will possibly attract more entrants to the field but without more educational capacity where will they go. If these new entrants do obtain their credentials how log will they stay in the field if something isn't done to address the staffing issues. Any successful approach will be multi-faceted and must engage all of the relevant stakeholders.

MANUFACTURING/LOGISTICS

Despite recent declines, manufacturing continues to play a major role in the economy for Indiana and for our region. One in five workers in EGR 10 is employed in the manufacturing sector and a number of sub-sectors for our region have experienced gains. Gains in employment occurred in: (1) Wood Products Manufacturing (88) jobs; (2) Computer & Electronic Products Manufacturing (178) jobs; (3) Electrical Equipment, Appliance, & Component Manufacturing (34 jobs); and (4) Primary Metals Manufacturing (55 jobs). Even though manufacturing experienced an overall reduction in workforce over the period 2001 through 2004, total manufacturing wages actually increased.

In the original Occupation and Skills Shortage Report nine critical manufacturing were projected to be in shortage. Those nine occupations were later pared to the three outlined below through the process described in the methodology section:

Category 1 – Manufacturing/Logistics

Occupation	SOC
Industrial Maintenance Technicians	49-9041
Machinists (Metal & Plastic)	51-4041
Production Workers – Other	51-9198

In addition, Industrial Engineering Technicians were targeted as a strategic shortage occupation and has since been categorized as emerging or changing do to the rapidly evolving skills required.

The final occupational area was in the Logistic sector, namely Truck Drivers (Heavy Tractor-Trailer). Median salaries, benefits, projected job growth and projected short-run and long-run shortages are provided in Table 8 below.

Table 8: Manufacturing/Logistics Occupation Wage, Benefit, and Shortage Estimates

MANUFACTURING/LOGISTICS PRIMARY TARGET OCCUPATIONS						
					Projected Shortage	
Occupation	Median Salary	Average Annual Benefits	# of Jobs 2002	% Growth 2002-2012	2007	2012
Machinists	$35,600	$12,866	562	14%	58	91
Production Workers	$22,500	$8,128	1264	10.8%	139	189
Industrial Maintenance Technicians	$44,600	$13,451	233	21.0%	53	35
Industrial Engineering Technicians	$35,900	$10,037	70	14.0%	N/A	N/A
Truck Drivers, Heavy and Tractor-Trailer	$31,480	$10,608	2,448	20%	195	461
Sources: Kentuckiana Occupational Outlook (benefits) & Bureau of Labor Statistics, Occupational Employment Statistics Survey						

Over the next few sections, details regarding the causes for the shortages for each of the above occupations will be outlined. As will be seen, many of the root causes for occupational shortages such as image issues and training are pervasive across the entire manufacturing sector.

Industrial Maintenance Technicians

This is an occupation in transition. Changing skills requirements combined with inadequate training is creating a shortage of the skilled workers needed. This is a vital occupation for many advanced manufacturers and the potential wages and benefits should be attractive to candidates. Shortages are particularly perplexing to smaller manufactures as they find it difficult to compete for the limited supply of skilled workers. This is an occupation represented by a number of different titles some of which require similar skills to Industrial Engineering Technicians. The wages for this occupation are provided in Table 9 below.

Table 9: Salary Data - Industrial Maintenance Technicians

Location	Pay Period	10%	25%	Median	75%	90%
United States	Hourly	$12.10	$14.96	$18.63	$22.97	$27.49
	Yearly	$25,200	$31,100	$38,800	$47,800	$57,200
Indiana	Hourly	$13.74	$16.60	$20.06	$24.58	$30.76
	Yearly	$28,600	$34,500	$41,700	$51,100	$64,000
Kentucky	Hourly	$12.49	$15.45	$19.10	$22.92	$26.33
	Yearly	$26,000	$32,100	$39,700	$47,700	$54,800
Louisville, KY-IN, MSA	Hourly	$12.84	$16.87	$21.44	$24.98	$26.99
	Yearly	$26,700	$35,100	$44,600	$52,000	$56,100

Source: Bureau of Labor Statistics, Occupational Employment Statistics Survey. Salary information is for 2003.

Education/Training & Technology Transition

As has been stated (and will be stated again), the transition to advanced manufacturing is requiring a shift in the skills needed for many occupations. There are

few occupations where this is more relevant than for industrial maintenance personnel. Technical and highly specialized skills that are not easily transferable are the norm. Training can be expensive both in terms of time and money and proper incentives to encourage and reward training are not uniformly available.

Human Resources

Many manufacturing HR departments are facing a crunch related to increasing retirements for this occupation. Companies have historically promoted from within or "borrowed" workers from their competitors. The shrinking pool of qualified candidates makes this task increasingly difficult.

Pipeline

The negative image faced by manufacturing is a pipeline factor here. Manufacturing is viewed as a shrinking sector by many and the perception of dirty or grimy tasks is pervasive. This has led to career opportunities not being promoted at the high school or community college level. Finally, real or perceived deficiencies regarding a career path to and from this occupation may be contributing to the shortage.

Leakage

There are a number of leakage components to this factor. Often, and especially when the economy is expanding, workers in this category have other opportunities available to them outside of traditional manufacturing. Construction is one such alternative. In addition, some workers for this occupation have migrated (along with some jobs) out of EGR 10. Migration patterns as discussed in the Phase 1 report show workers for this occupation moving primarily to southern or southeastern states such as North Carolina.

Sensitivity

The cause map and ranking of root causes are provided in Figure 7 and Table 10 on the next two pages. Addressing training and image issues are likely to provide substantial reductions in the shortage for this occupation. A number of strategies can address both issues simultaneously such as partnering with high schools and developing apprenticeship schools. Incumbent worker competencies could be examined to assist workers in transferring their skills to this occupation from those in decline.

Figure 7: Shortage Cause Map - Industrial Maintenance Technicians

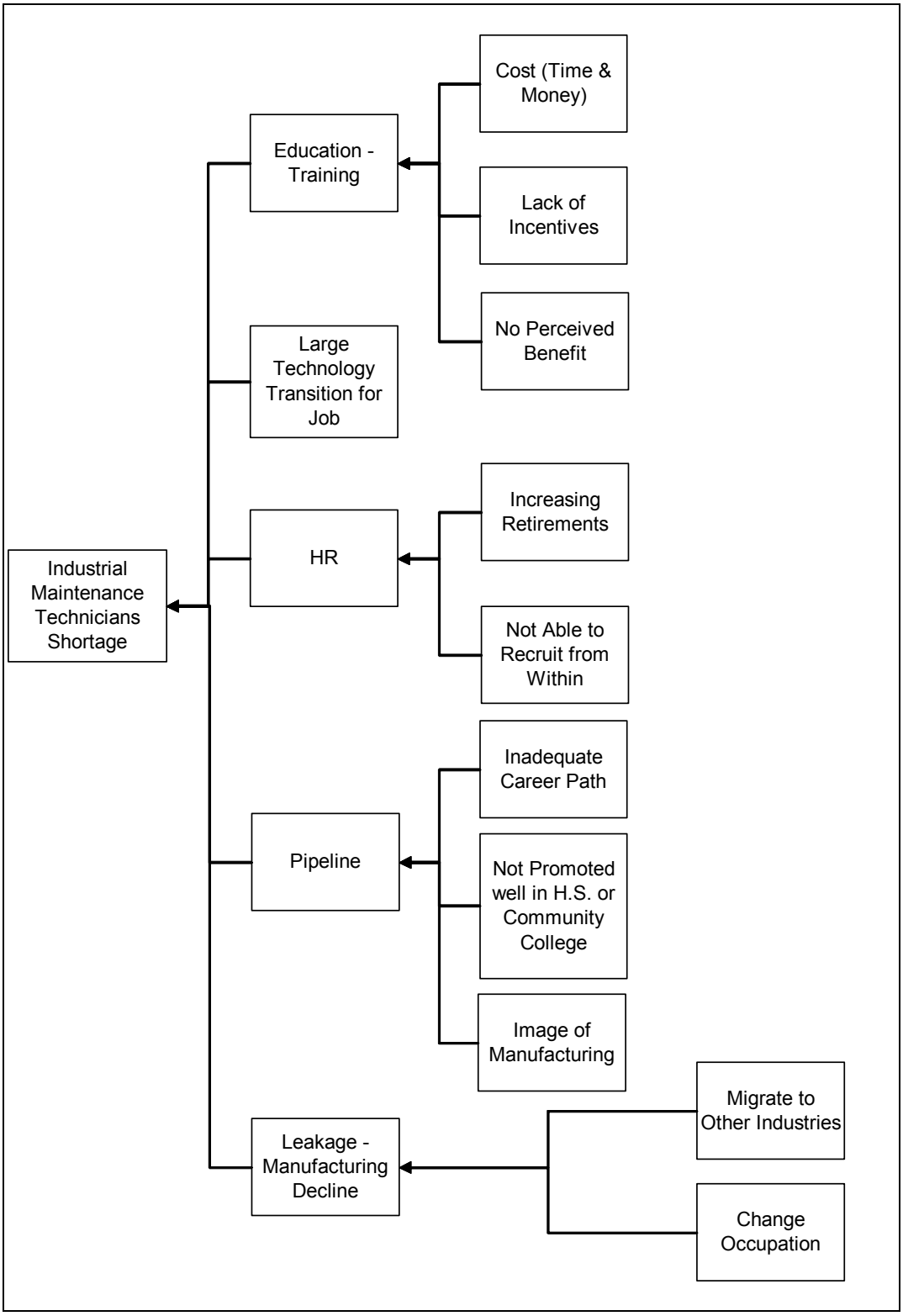


Table 10: Root Cause Ranking – Industrial Maintenance Technicians

Root Cause and Potential Solution Impact Ranking: Industrial Maintenance Technicians		
Root Cause	**Relative Importance/Impact[a]**	**SSI Solution Suitability Factor (Line of Sight)[b]**
Education – Training	**1**	**1**
Large Technology Transition for Occupation	**1**	4
Human Resource Issues	**2**	**2**
Pipeline	3	**2**
Leakage – Manufacturing Decline	4	4

[a] For the relative importance/impact column a lower number indicates a greater impact on the shortage with a rank of 1 indicating the largest contributing factor. When two or more root causes have the same ranking their impact was determined to be equivalent.

[b] Keeping the line of sight and the solutions phase in mind, the third column (SSI Solution Suitability Factor) is an attempt to rank which, if any, of the contributing factors is appropriate to address directly with SSI funding. This is an early-estimation step in determining which causes are appropriate for targeting by workforce development system funds. This early-estimation does not preclude or ignore direct investment by employers or the availability or usage of other funds; these other resources are integral to real, long-term solutions. The ranking is simply an attempt to look, at a glance, at which root causes may be more amenable to being addressed and resolved through the various SSI funds. Consequently, the ranking helps to indicate who exerts more control over the solvability of other root causes, such as the employer, a sector network, public policy/legislation ,etc.

The rankings are:

1. There is a high likelihood that significant impacts can be made on the root cause and positively impact the occupational shortage through SSI funding. An example would be where dollars could go directly towards reducing the cost of training for employees or potential employees and would likely lead to a measurable desired outcome.
2. Opportunities for solution development are possible, but the positive impact appears less certain or possibly smaller than a 1 ranking.
3. Although solution development opportunities are possible, several factors/dynamics exist which could constrain the returns of SSI investment significantly.
4. This category indicates that the root cause is outside the locus of control (e.g. the aging population and some leakage situations) and therefore inappropriate for SSI Funding.

Machinists (Metal & Plastic)

A common theme for manufacturing occupations, training and image, come to the forefront in explaining shortages.

Training

This is a skilled occupation and the skills themselves are evolving or shifting as manufacturing moves from "old school" to a newer "advanced" state. Various job titles under this occupation are machinist, machine operator, machinist tool and die, maintenance specialist, set-up machinist, utility operator, maintenance machinist, production machinist, maintenance technician, MTD (mold tooling designer).[16] This is a broad list and it appears that training opportunites are limited or are not available to hone the requisit skill sets for this occupation.

Image

The image for manufacturing is one of layoffs, dirty and grimy work, low wages and dead-end jobs. This will take some work to overcome as many modern manufacturers no longer fit this picture. In addition, wages for this occupation appear adequate (Table 11 below) at the median although the lower quartile is fairly low. Proper promotion of this job along will be vital.

[16] Source: O*NET

Table 11: Salary Data - Machinists

Location	Pay Period	10%	25%	Median	75%	90%
United States	Hourly	$9.91	$12.63	$16.15	$20.16	$24.03
	Yearly	$20,600	$26,300	$33,600	$41,900	$50,000
Indiana	Hourly	$10.99	$13.53	$16.62	$20.21	$23.18
	Yearly	$22,900	$28,100	$34,600	$42,000	$48,200
Kentucky	Hourly	$9.65	$12.16	$15.31	$18.82	$21.65
	Yearly	$20,100	$25,300	$31,800	$39,100	$45,000
Louisville, KY-IN, MSA	Hourly	$10.18	$13.04	$17.11	$20.47	$25.60
	Yearly	$21,200	$27,100	$35,600	$42,600	$53,200

Source: Bureau of Labor Statistics, Occupational Employment Statistics Survey. Salary information is for 2003.

Recruitment

Recruitment for this occupation has been ineffective and impacted by increasing retirements within the existing ranks. The overall decline in manufacturing masks the fact that certain sub-sectors within EGR 10 are actually expanding. Finally, the training of incumbent workers for this occupation is not happening. Many employers have "stolen" workers for this category from competitors in the past but with retirements and the shrinking pool available this will become more difficult.

Sensitivity

The cause map and ranking of root causes are provided in Figure 8 and Table 12 on the next two pages. The image of manufacturing as a declining industry with only low paying jobs must be addressed and the various career paths promoted. Facing this issue and providing training along with appropriate incentives and rewards will have a

measurable impact recruitment and retention and go a long way towards reducing this shortage.

Figure 8: Shortage Cause Map - Machinists

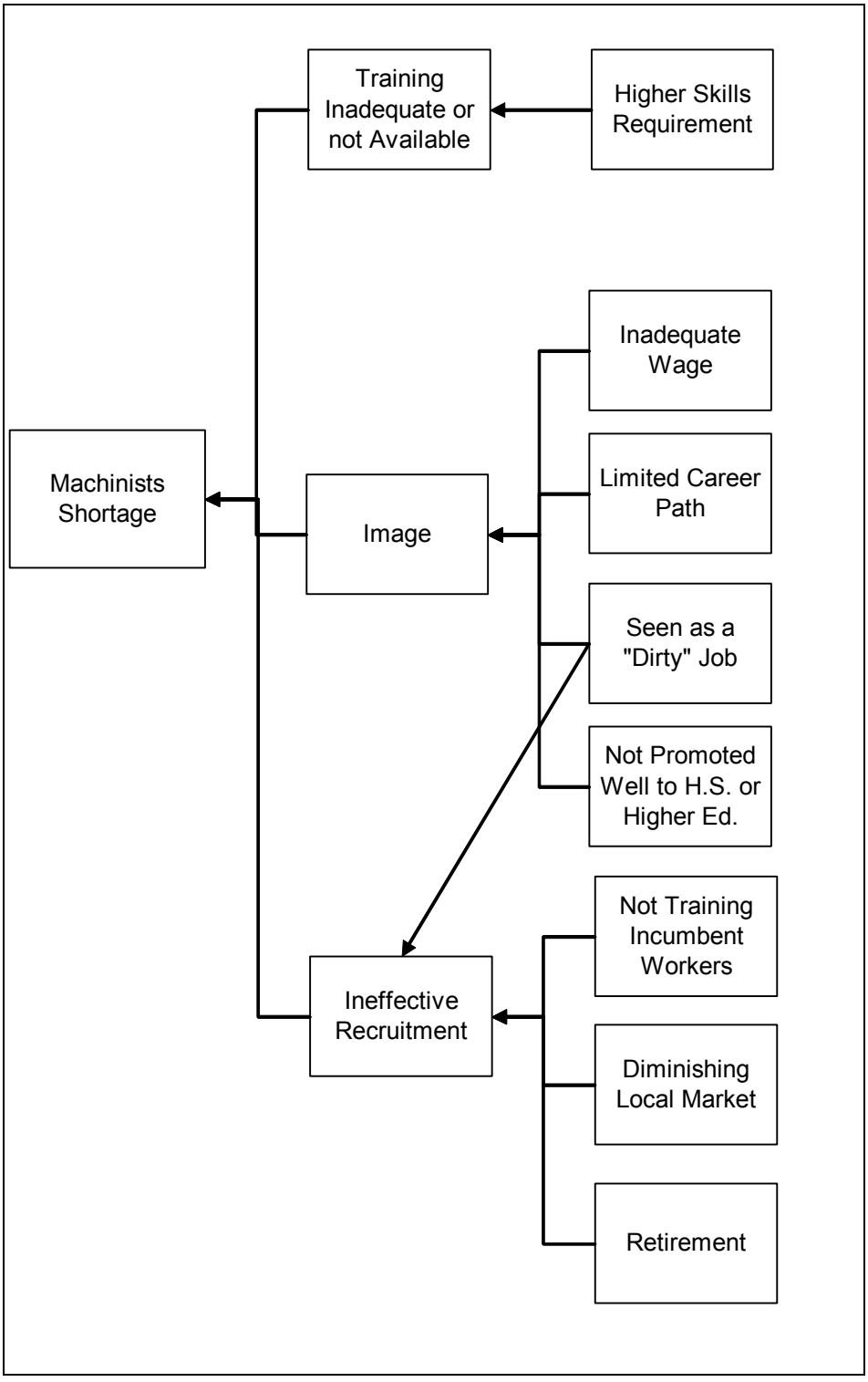


Table 12: Root Cause Ranking – Machinists

Root Cause and Potential Solution Impact Ranking: Machinists		
Root Cause	**Relative Importance/Impact[a]**	**SSI Solution Suitability Factor (Line of Sight)[b]**
Training Inadequate or not Available	**1**	**2**
Image	**1**	**2**
Ineffective Recruitment	**1**	**2**

[a] For the relative importance/impact column a lower number indicates a greater impact on the shortage with a rank of 1 indicating the largest contributing factor. When two or more root causes have the same ranking their impact was determined to be equivalent.

[b] Keeping the line of sight and the solutions phase in mind, the third column (SSI Solution Suitability Factor) is an attempt to rank which, if any, of the contributing factors is appropriate to address directly with SSI funding. This is an early-estimation step in determining which causes are appropriate for targeting by workforce development system funds. This early-estimation does not preclude or ignore direct investment by employers or the availability or usage of other funds; these other resources are integral to real, long-term solutions. The ranking is simply an attempt to look, at a glance, at which root causes may be more amenable to being addressed and resolved through the various SSI funds. Consequently, the ranking helps to indicate who exerts more control over the solvability of other root causes, such as the employer, a sector network, public policy/legislation ,etc.

The rankings are:

1. There is a high likelihood that significant impacts can be made on the root cause and positively impact the occupational shortage through SSI funding. An example would be where dollars could go directly towards reducing the cost of training for employees or potential employees and would likely lead to a measurable desired outcome.
2. Opportunities for solution development are possible, but the positive impact appears less certain or possibly smaller than a 1 ranking.
3. Although solution development opportunities are possible, several factors/dynamics exist which could constrain the returns of SSI investment significantly.
4. This category indicates that the root cause is outside the locus of control (e.g. the aging population and some leakage situations) and therefore inappropriate for SSI Funding.

Production Workers

For EGR 10, this occupational description is a habitual problem for employers in the manufacturing sector. It is difficult to hire and retain production workers. As usual, wages and image are primary culprits.

High Turnover

There is a very high turnover rate for manufacturing employers (some more so than others) for this occupation. The work can be physically demanding and the wages can be on the same level as that for many service jobs. The wages for production labors/helpers are provided in Table 13 below. This is not the whole story however as the distinction between production laborers (who may require slightly higher skill sets and are given more responsibilities) and production helpers can be dramatic. The salary is two tiered. In the first tier are production laborers and helpers in plum jobs such as those at the Ford plant in Louisville. The median salaries for these occupations can be as high as the mid-40s. Employers in this category have no or only limited problems in finding workers, although finding skilled workers may still be a challenge. The second tier is basically everybody else. The salary discrepancies for a number of regional MSAs are provided in Table 14 on the following page.

Table 13: Salary Data - Production Workers

Location	Pay Period	10%	25%	Median	75%	90%
United States	Hourly	$6.75	$7.81	$9.58	$12.08	$15.16
	Yearly	$14,000	$16,200	$19,900	$25,100	$31,500
Indiana	Hourly	$7.28	$8.29	$10.04	$12.40	$15.41
	Yearly	$15,100	$17,200	$20,900	$25,800	$32,100
Kentucky	Hourly	$7.56	$9.28	$11.81	$14.35	$16.42
	Yearly	$15,700	$19,300	$24,600	$29,800	$34,200

Source: Bureau of Labor Statistics, Occupational Employment Statistics Survey. Salary information is for 2003.

Table 14: Salary Data - Production Helpers vrs. Production Laborers

Location	Pay Period	Production – Helpers (51-9198.02)	Production – Laborers (51-9198.01)
Elkhart-Goshen, IN	Hourly	$9.87	$16.85
	Yearly	$20,500	$35,000
Fort Wayne, IN	Hourly	$10.14	$21.65
	Yearly	$21,100	$45,000
Indianapolis, IN	Hourly	$9.64	$22.95
	Yearly	$20,100	$47,700
Louisville, KY-IN	Hourly	$10.80	$21.94
	Yearly	$22,500	$45,600

Source: Bureau of Labor Statistics, Occupational Employment Statistics Survey. Salary information is for 2003.

Recruitment

Recruitment is difficult for this occupation because of wages, the manufacturing image problem, ineffective HR screening, and ineffective screening by Work One. One employer stated that Work One "sends everybody" regardless of qualifications. There also appears to be a lack of knowledge regarding a career ladder for these occupations. While it is true that many of the starting level salaries are low, the door is open for advancement.

Corporate Culture

Workers in this category appear to be seen as expendable by many employers. There are vast differences in training across employers with some providing a great deal of assistance and others providing little or none. Sometimes when employers do provide training opportunities proper incentives are not used to ensure the use of these services. In addition to a lack of incentives the training at some organizations can be spotty and disorganized. Often employees may be promoted to the supervisory level with little or not training. One of the forum participants stated, "Supervisors get a quick update on paperwork, and then we throw them to the wolves." Improperly trained supervisors exacerbate work environment issues which in turn lead to higher employee dissatisfaction and turnover.

Sensitivity

Evolving skills are needed for manufacturing at all levels. Employers must do more than make training available, they must provide appropriate incentives for training to show that it is valued by the employer and beneficial to the worker. Any efforts that lead to increased training or the increased utilization of currently available training will

likely reduce turnover. Other than higher wages, work towards changing the image of manufacturing and providing career ladders or simply increasing awareness about career ladders will have the biggest impact on recruitment efforts. The cause map and ranking of root causes are provided in Figure 9 and Table 15 on the next two pages.

Figure 9: Shortage Cause Map - Production Workers

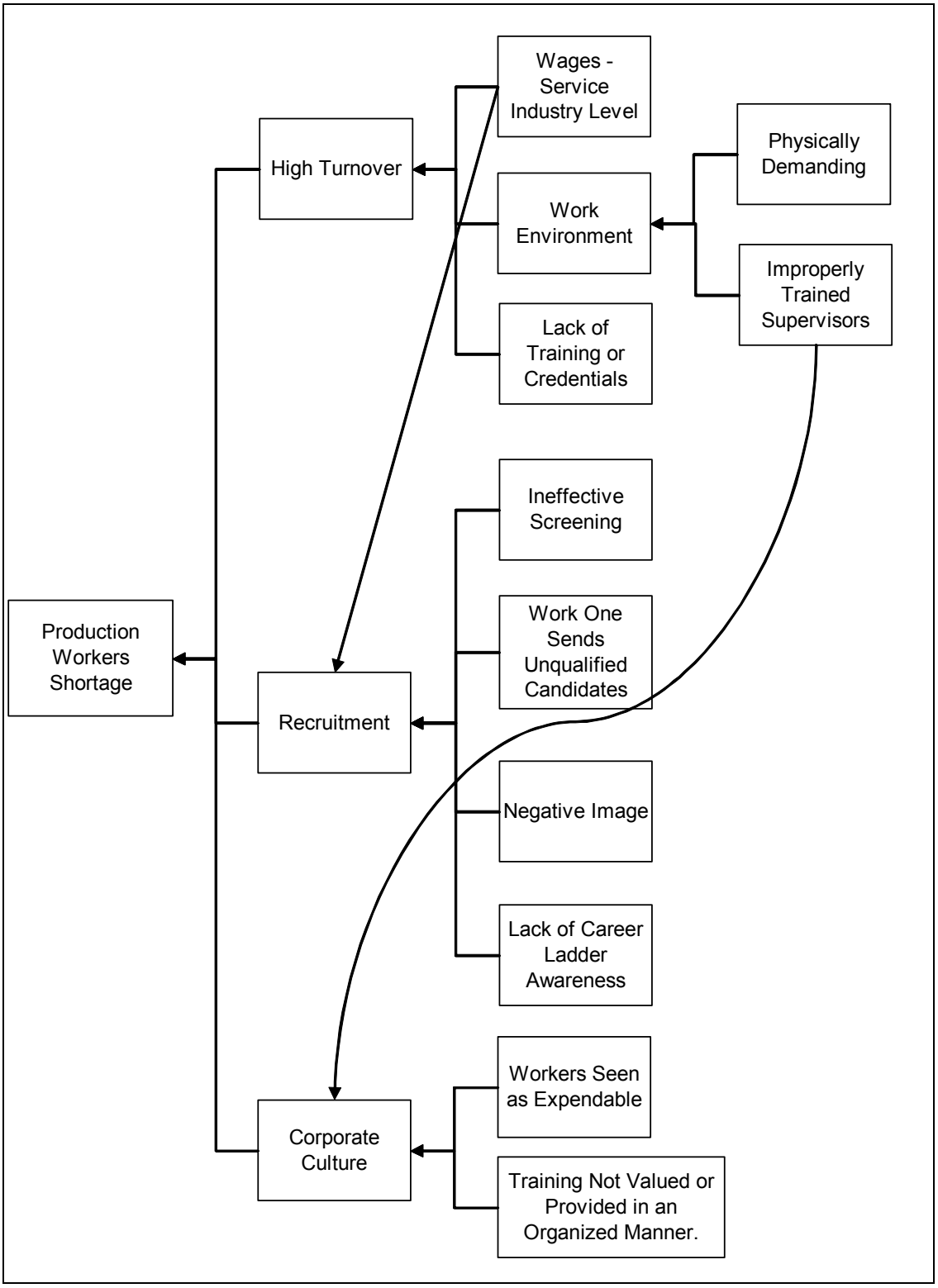


Table 15: Root Cause Ranking – Production Workers

Root Cause and Potential Solution Impact Ranking: Production Workers (Laborers & Helpers)		
Root Cause	**Relative Importance/Impact[a]**	**SSI Solution Suitability Factor (Line of Sight)[b]**
High Turnover	**1**	**2** – 3
Recruitment	**1**	**1**
Corporate Culture	**2**	3

[a] For the relative importance/impact column a lower number indicates a greater impact on the shortage with a rank of 1 indicating the largest contributing factor. When two or more root causes have the same ranking their impact was determined to be equivalent.

[b] Keeping the line of sight and the solutions phase in mind, the third column (SSI Solution Suitability Factor) is an attempt to rank which, if any, of the contributing factors is appropriate to address directly with SSI funding. This is an early-estimation step in determining which causes are appropriate for targeting by workforce development system funds. This early-estimation does not preclude or ignore direct investment by employers or the availability or usage of other funds; these other resources are integral to real, long-term solutions. The ranking is simply an attempt to look, at a glance, at which root causes may be more amenable to being addressed and resolved through the various SSI funds. Consequently, the ranking helps to indicate who exerts more control over the solvability of other root causes, such as the employer, a sector network, public policy/legislation ,etc.

The rankings are:

1. There is a high likelihood that significant impacts can be made on the root cause and positively impact the occupational shortage through SSI funding. An example would be where dollars could go directly towards reducing the cost of training for employees or potential employees and would likely lead to a measurable desired outcome.
2. Opportunities for solution development are possible, but the positive impact appears less certain or possibly smaller than a 1 ranking.
3. Although solution development opportunities are possible, several factors/dynamics exist which could constrain the returns of SSI investment significantly.
4. This category indicates that the root cause is outside the locus of control (e.g. the aging population and some leakage situations) and therefore inappropriate for SSI Funding.

Truck Drivers – CDL (Heavy Tractor-Trailer)

A shortage of truck drivers follows closely behind a shortage of skilled workers for the manufacturing industry and any number of healthcare occupations in terms of national attention. Nationally the shortage is approximately 20,000 long-haul drivers with some estimates of a long-run shortage (out to 2014) of more than 100,000.[17] The main contributory factors for the trucker shortage are wages and lifestyle.

Wages

Relatively low salaries are one of the primary reasons for the continued shortage of truckers. Salary data for CDL heavy truck drivers is provided in Table 16 below. Although there doesn't appear to be a relative wage disadvantage as compared to national or state levels, the overall level of pay is only marginally above the self-sufficiency rate for a family. During periods of economic growth truck drivers are lured into construction and manufacturing occupations which may provide higher wages. Even if the wages and other financial benefits are the same, these jobs typically allow the workers to spend more time at home with their families as opposed to being on the road.

In addition to the wages being relatively low, the pay structure itself likely leads to high turnover. Historically truck drivers were paid by-the-mile with no compensation for idle time during layovers or during loading and unloading. There is also little evidence of pay for seniority. Drivers will often shift employers for a small difference in the mileage rate. It seems likely that higher pay and more creative pay structures will be needed to recruit and retain individuals for this occupation.

[17] Reprint of NY Times Herald-Record article, Oct. 26, 2005. Reference Source: http://www.layover.com/cgi-bin/portal/printnews.pl/8879.html

Table 16: Salary Data - Truck Drivers

Location	Pay Period	10%	25%	Median	75%	90%
United States	Hourly	$10.07	$12.55	$15.98	$19.93	$23.79
	Yearly	$20,900	$26,100	$33,200	$41,500	$49,500
Indiana	Hourly	$10.21	$13.16	$16.67	$20.61	$24.66
	Yearly	$21,200	$27,400	$34,700	$42,900	$51,300
Kentucky	Hourly	$9.82	$11.96	$14.56	$18.01	$22.29
	Yearly	$20,400	$24,900	$30,300	$37,500	$46,400
Louisville, KY-IN, MSA	Hourly	$11.30	$12.89	$15.38	$18.34	$22.28
	Yearly	$23,500	$26,800	$32,000	$38,100	$46,300

Source: Bureau of Labor Statistics, Occupational Employment Statistics Survey. Salary information is for 2003.

Turnover

There's an old song from a 70's TV show with the phrase, "It takes a special breed to be a truck drivin' man." Although we could add "or woman" to the phrase it is certainly true. The job itself calls for long hours, questionable nutritional intake from various road-side sources, and large amounts of time away from home. It is estimated that as much as a third of a long-haul driver's time is spent away from home.[18] Many of the drivers who make trucking a career certainly must have an independent spirit in order to deal with this kind of lifestyle. Furthermore, the training a driver receives is just that, job training. The training may involve driving issues and coping with life on the road but not career related issues. These factors combine with the pay structure to exacerbate the high turnover rates suffered by the trucking industry.

[18] Wong, Brad, "Truck Driver Shortage Grows More Acute," Seattle Post-Intelligencer, Oct. 10, 2005. Reference Source: http://seattlepi.nwsource.com/business/243934_truckers10.html

Other Pipeline Issues

There are a number of pipeline issues that impact driver shortages. First, one must be 21 years of age or older to obtain a CDL and become an interstate driver. The reality is that many insurers will not provide coverage for drivers who are under the age of 25.[19] Many candidates would have found other lines of work by the time they reach the age of 21 or 25. Insurers will often also require some experience, maybe 2 years worth, and a clean driving record before providing coverage. This means that an individual could have her CDL, be 25 or older, and still not qualify for the job because of lack of experience. Often experience will come from driving smaller trucks on a local level. Since the pay for these types of trucking jobs is lower than that for heavy drivers the effective cost of entry is increased.

Educational Output

One of the primary factors that influence the production of Commercial Drivers Licenses (CDLs) is the cost. Obtaining a CDL can cost as much as $2,000 and attending a trucking school can take up to four weeks of full-time study and cost as much as $6,500.[20] Given the long hours and relatively low pay the return on this type of investment is not attractive to many would-be candidates.

In addition to the cost of obtaining a CDL, there were some training cutbacks and closures of some driving schools after 9/11. Increased regulations and oversight limited the pool of applicants and placed additional burdens on the schools themselves. As reported in the *Kentuckiana Occupational Outlook* (2003), there was an approximate 20% to 25% decline in the number of CDL (commercial driving license) graduates across

[19] Reprint of NY Times Herald-Record article, Oct. 26, 2005. Reference Source: http://www.layover.com/cgi-bin/portal/printnews.pl/8879.html
[20] Federal Reserve Bank of Minneapolis, "Keep on Truckin'," March 2005. Reference Source: http://woodrow.mpls.frb.fed.us/pubs/fedgaz/05-03/trucking.cfm

the state of Kentucky with similar impacts in the Louisville MSA and Southern Indiana region.

Sensitivity

This is another occupation where an increase in wages would attract more workers but possibly not be adequate to keep them in the field. The same is true regarding assisting applicants in obtaining their CDL. Many may try the job out and decide the lifestyle issues more than offset any higher wages. The nature of the job precludes the lifestyle from being changed too much, but employers can become more creative in scheduling to allow more time and home and coordinating shipments through hub systems to reduce the distance from home that truckers must drive. Further, unless the structure of the wages is modified to address downtime and seniority there will continue to be high turnover rates. The cause map and ranking of root causes are provided in Figure 10 and Table 17 on the next two pages.

Figure 10: Shortage Cause Map - Truck Drivers (Heavy)

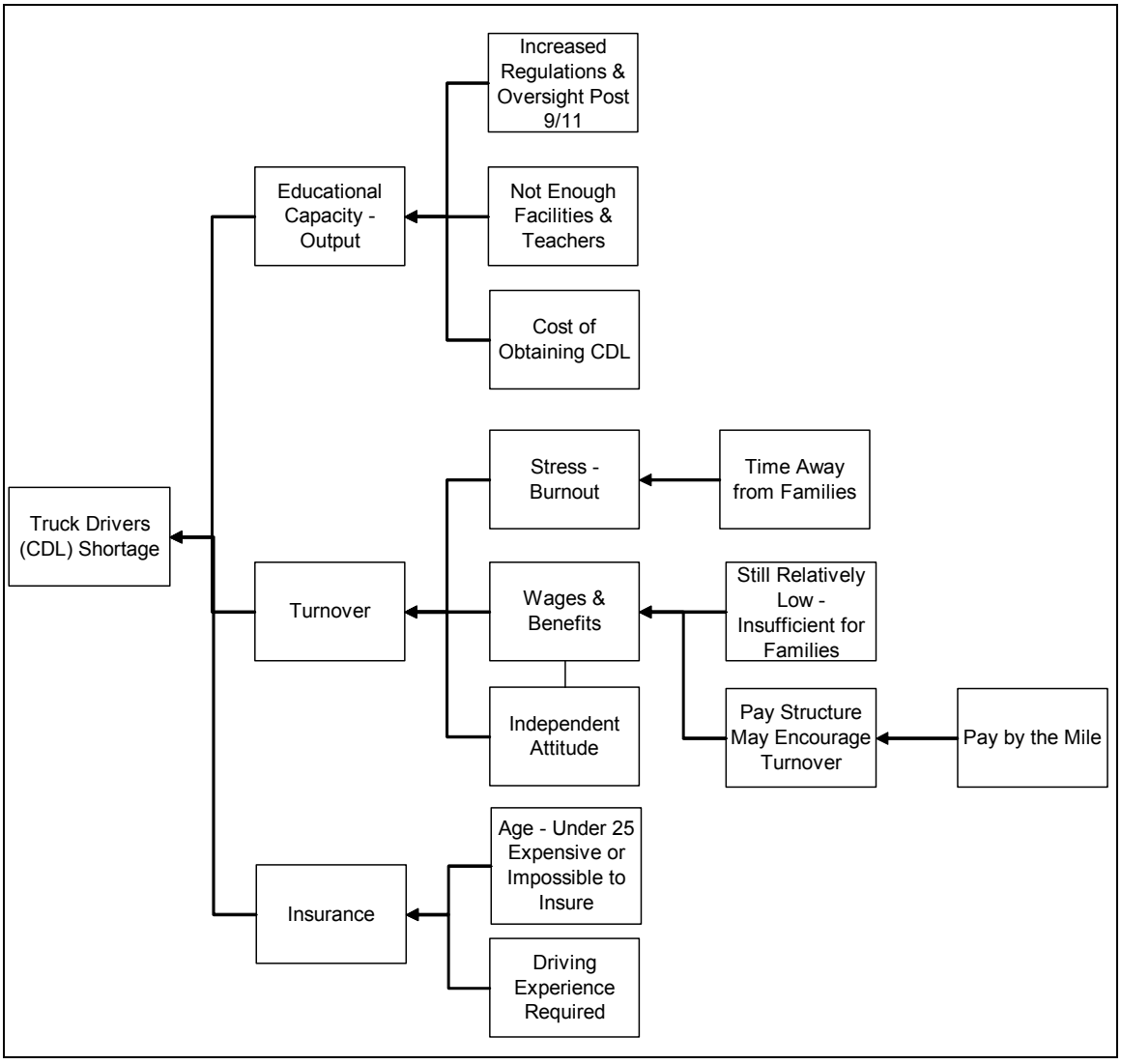


Table 17: Root Cause Ranking – Truck Drivers (Heavy Tractor-Trailer)

Root Cause and Potential Solution Impact Ranking: Truck Drivers – CDL (Heavy Tractor-Trailer		
Root Cause	**Relative Importance/Impact[a]**	**SSI Solution Suitability Factor (Line of Sight)[b]**
Educational Capacity – Output	**1**	**2**
Turnover	**1**	3
Insurance	**2**	4

[a] For the relative importance/impact column a lower number indicates a greater impact on the shortage with a rank of 1 indicating the largest contributing factor. When two or more root causes have the same ranking their impact was determined to be equivalent.

[b] Keeping the line of sight and the solutions phase in mind, the third column (SSI Solution Suitability Factor) is an attempt to rank which, if any, of the contributing factors is appropriate to address directly with SSI funding. This is an early-estimation step in determining which causes are appropriate for targeting by workforce development system funds. This early-estimation does not preclude or ignore direct investment by employers or the availability or usage of other funds; these other resources are integral to real, long-term solutions. The ranking is simply an attempt to look, at a glance, at which root causes may be more amenable to being addressed and resolved through the various SSI funds. Consequently, the ranking helps to indicate who exerts more control over the solvability of other root causes, such as the employer, a sector network, public policy/legislation ,etc.

The rankings are:

1. There is a high likelihood that significant impacts can be made on the root cause and positively impact the occupational shortage through SSI funding. An example would be where dollars could go directly towards reducing the cost of training for employees or potential employees and would likely lead to a measurable desired outcome.
2. Opportunities for solution development are possible, but the positive impact appears less certain or possibly smaller than a 1 ranking.
3. Although solution development opportunities are possible, several factors/dynamics exist which could constrain the returns of SSI investment significantly.
4. This category indicates that the root cause is outside the locus of control (e.g. the aging population and some leakage situations) and therefore inappropriate for SSI Funding.

Industrial Engineering Technicians

Although anecdotal evidence implies a shortage in the area of industrial engineering techs, the forecasts from our Phase 1 report did not bear this out. This issue was discussed with industry representatives and it was determined that the likely explanation for the discrepancy lies in the O*NET naming format. Some of the O*NET nomenclature is outdated. The specific occupations that are likely in shortage which would not have been captured in either the ERISS survey or the local survey are[21]:

- 49-9044.00 Millwright (These are mechanical maintenance people)
- 49-9041.00 Industrial Machinery Mechanic
- 17-3023.01 Electronic Engineering Technician
- 17-3023.03 Electrical Engineering Technician
- 17-3023.02 Calibration/ Instrumentation Technician
- 49-9042.00 Maintenance Repairer
- 17-3027.00 Mechanical Engineering Technician
- 49-2094.00 Electrical Electronic Repairers
- 17-3024.00 Electro-mechanical Technician
- 49-9043.00 Machinery Maintenance Worker

Additional job labels for this occupation include Manufacturing Engineer, Engineering Technician, Project Engineer, Production Staff Worker, Process Documentation And Methods Analyst, Industrial Engineering Analyst, Tool Representative, Quality Process

[21] Thanks to Paul Perkins at Amatrol for providing this list and rational for apparent discrepancies in the anecdotal and empirical evidence relating to shortages for industrial engineering techs.

Engineer, and Manufacturing Technician. A similar issue is associated with the Industrial Maintenance Technician occupation as well (note the Maintenance Repairer occupation).

For this reason, an additional tier was developed for the Industrial Engineering Techs (SOC 17-3026). This was deemed necessary due to the changing nature of this occupation in an advanced manufacturing environment. As the manufacturing industry changes and with the advent of advanced manufacturing, this occupation itself is changing. Although the occupation name is not new, the changing nature of the job and requisite skills place the job in an emerging or changing category.

Pipeline

There are a number of pipeline issues that impact the shortage for this occupation. First, the image problem facing manufacturing is a factor for all manufacturing occupations. In particular, this occupation is confused with older traditional manufacturing occupations and is not well promoted at the high school level. In addition to image issues there is a lack of local candidates with the requisite skill set for these jobs and a lack of awareness regarding career paths.

Recruitment

Both the image issue and the dearth of appropriately skilled candidates are exacerbating recruitment for this occupation.

Education

The cost of obtaining and education for these occupations can be a hurdle as is the rigor of the coursework necessary. Strong math skills are required (knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications) as is a knowledge of the practical application of engineering science and technology. Also

many of the credits in 2 year programs may not transfer into 4 year programs further discouraging entrants.

Wages

Wages for this occupation are provided in Table 18 and appear to be reasonable although relatively lower in the Louisville MSA as compared to the national and Indiana averages. The actual wage range is in fact much larger when the many different occupational titles are considered. It is not believed that wages are a major contributing factor for this occupation as some of the different related occupations listed above pay more than is indicated in Table 18. However, lack of knowledge regarding those job descriptions and wages may be a minor contributory factor.

Table 18: Salary Data - Industrial Engineering Technicians

Location	Pay Period	10%	25%	Median	75%	90%
United States	Hourly	$13.41	$16.33	$20.61	$26.75	$34.63
	Yearly	$27,900	$34,000	$42,900	$55,600	$72,000
Indiana	Hourly	$13.63	$16.94	$20.00	$24.70	$31.23
	Yearly	$28,400	$35,200	$41,600	$51,400	$65,000
Kentucky	Hourly	$12.52	$14.81	$18.09	$23.94	$31.86
	Yearly	$26,000	$30,800	$37,600	$49,800	$66,300
Louisville, KY-IN, MSA	Hourly	$12.60	$14.59	$17.24	$23.75	$26.58
	Yearly	$26,200	$30,300	$35,900	$49,400	$55,300

Source: Bureau of Labor Statistics, Occupational Employment Statistics Survey. Salary information is for 2003.

Leakage

Leakage does appear to be a contributing factor for this occupation. Many have options in Louisville and there is a trend for individuals to leave manufacturing firms in favor of engineering and consulting firms.

Sensitivity

The cause map and root cause ranking for this occupation are provided in Figure 11 and Table 19, respectively. It seems likely that only higher salaries will impact the leakage issue. However many of the pipeline and recruitment issues can be addressed by tackling the image problem associated with manufacturing and by increasing career awareness for the many job functions available under this category.

Figure 11: Shortage Cause Map - Industrial Engineering Technicians

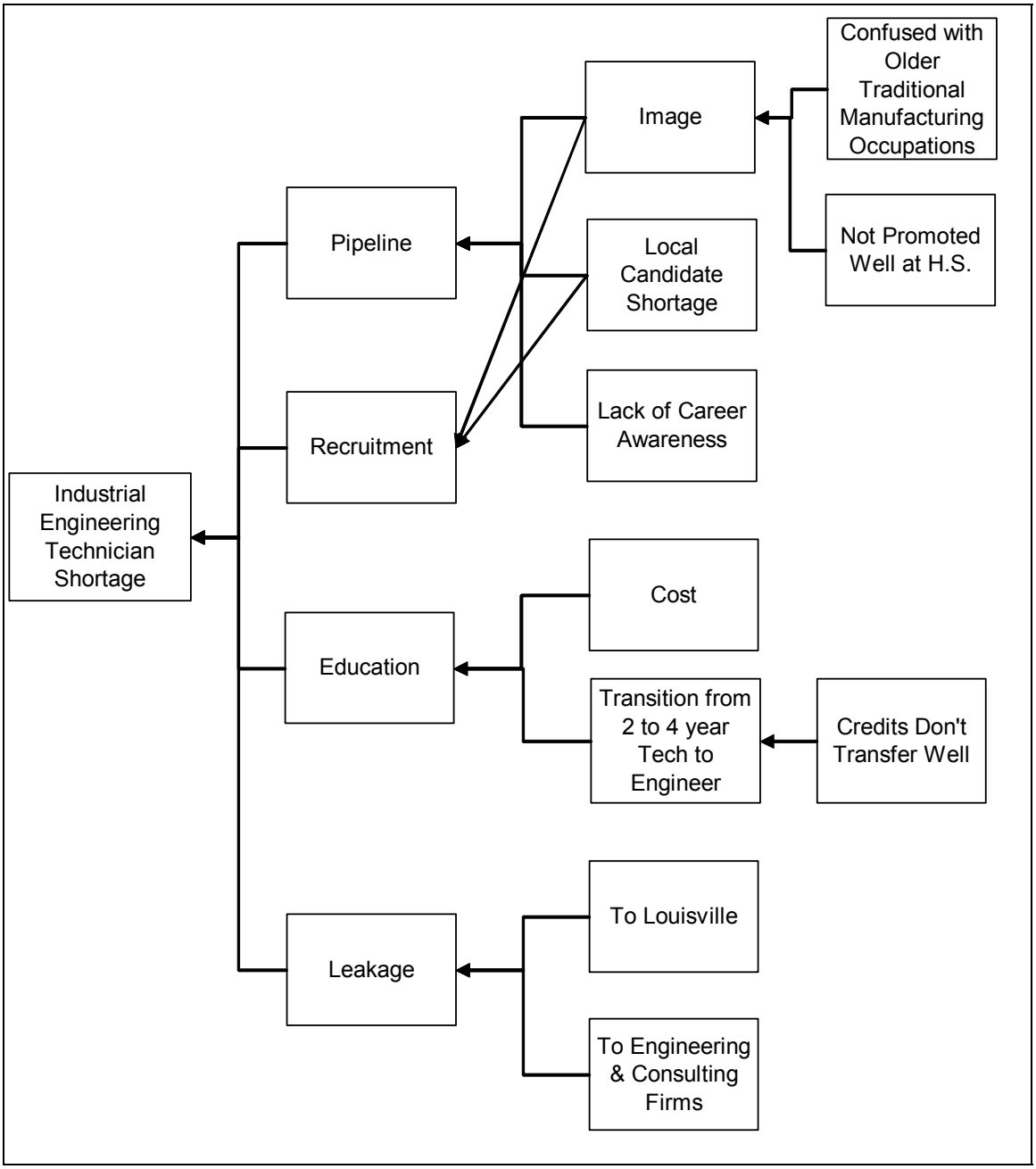


Table 19: Root Cause Ranking – Industrial Engineering Technicians

Root Cause and Potential Solution Impact Ranking: Industrial Engineering Technicians		
Root Cause	**Relative Importance/Impact[a]**	**SSI Solution Suitability Factor (Line of Sight)[b]**
Pipeline	**1**	**1**
Recruitment	**2**	**1 – 2**
Education	**1**	**2**
Leakage	3	4

[a] For the relative importance/impact column a lower number indicates a greater impact on the shortage with a rank of 1 indicating the largest contributing factor. When two or more root causes have the same ranking their impact was determined to be equivalent.

[b] Keeping the line of sight and the solutions phase in mind, the third column (SSI Solution Suitability Factor) is an attempt to rank which, if any, of the contributing factors is appropriate to address directly with SSI funding. This is an early-estimation step in determining which causes are appropriate for targeting by workforce development system funds. This early-estimation does not preclude or ignore direct investment by employers or the availability or usage of other funds; these other resources are integral to real, long-term solutions. The ranking is simply an attempt to look, at a glance, at which root causes may be more amenable to being addressed and resolved through the various SSI funds. Consequently, the ranking helps to indicate who exerts more control over the solvability of other root causes, such as the employer, a sector network, public policy/legislation ,etc.

The rankings are:

1. There is a high likelihood that significant impacts can be made on the root cause and positively impact the occupational shortage through SSI funding. An example would be where dollars could go directly towards reducing the cost of training for employees or potential employees and would likely lead to a measurable desired outcome.
2. Opportunities for solution development are possible, but the positive impact appears less certain or possibly smaller than a 1 ranking.
3. Although solution development opportunities are possible, several factors/dynamics exist which could constrain the returns of SSI investment significantly.
4. This category indicates that the root cause is outside the locus of control (e.g. the aging population and some leakage situations) and therefore inappropriate for SSI Funding.

Manufacturing/Logistics Summary

Root Cause and Potential Solution Impact Ranking Manufacturing/Logistics		
Root Cause	**Relative Importance/Impact[a]**	**SSI Solution Suitability Factor (Line of Sight)[b]**
Industrial Maintenance Technicians		
Education – Training	**1**	**1**
Large Technology Transition for Occupation	**1**	4
Human Resource Issues	**2**	**2**
Pipeline	3	**2**
Machinists		
Training Inadequate or not Available	**1**	**2**
Image	**1**	**2**
Ineffective Recruitment	**1**	**2**
Production Workers (Laborers & Helpers)		
High Turnover	**1**	**2** – 3
Recruitment	**1**	**1**
Corporate Culture	**2**	3
Truck Drivers – CDL (Heavy Tractor-Trailer)		
Educational Capacity – Output	**1**	**2**
Turnover	**1**	3
Insurance	**2**	4
Industrial Engineering Technicians		
Pipeline	**1**	**1**
Recruitment	**2**	**1 – 2**
Education	**1**	**2**
Leakage	3	4

Two strong underlying themes represent manufacturing: Training & Image. Most of the evidence (both primary and secondary) indicate that training is key to reducing employee turnover. The skills needed for many manufacturing jobs are changing rapidly and training is essential as older employees retire. Some means must be

developed to assist incumbent workers in declining occupations “retool” for emerging and growing manufacturing jobs.

Recent layoffs, the contraction of the industry in the state and nation, and the perception of the work as “dirty” or “grimy” keep potential recruits at bay. There is the perception that many manufacturers view workers as expendable. The skilled and talented seek work elsewhere placing a squeeze on new economy, advanced manufacturers. Changing the image of manufacturing is paramount if shortages are to be stemmed for this industry.

Skills Set Analysis Relative to Critical Occupations

As intended by the name of this initiative, the emphasis for EGR 10's Root Cause Analysis has been placed both on Critical Occupations and on Skills Sets that affect occupations in one or both of the industries studied. To best address the skills shortages identified by employers and employees in Phases 1 and 2's research, we first re-examined the skills deficiency areas noted in the Phase 1 results. Across both industries, the replication of skills in shortage was great; as such, we synthesized two lists into one, which is as follows:

List of Skills Deficiency Areas – Health Care and Advanced Manufacturing

- Computer/Technology
- Employability Skills
- Supervisory Skills
- Teamwork
- Mathematics Aptitude
- Oral Communication Enhancement

Next, we studied the skills sets listed in the Skills Crosswalk, as noted on the SSI website. From said file, we developed a modified crosswalk that exemplified the skills needed for each critical occupation in shortage named by EGR 10 and noted the replication of skills needed across occupations.

Lastly, the Work Team studied the list of Deficiency Areas relative to the Skills Crosswalk and to the occupations noted therein and reached the conclusion that the skills sets identified in the crosswalk could be easily folded into various skills modules that could then be applied to all of the critical occupations identified by the EGR 10 study and

could in the Phase 3 process, transfer easily into curriculum development. The melding of the two above-mentioned research components is exemplified in the chart below:

Skills Modules Attributable Across All Critical Occupations

Skill Module	Skill Sets to be Addressed	
Computer/Technology	Active Learning Critical Thinking Equipment Maintenance Equipment Selection Installation Judgment & Decision Making Mathematics Monitoring	Operation and Control Operation Monitoring Problem Solving Quality Control Analysis Reading Comprehension Repairing Troubleshooting
Employability Skills	Active Learning Active Listening Critical Thinking Judgment & Decision Making Mathematics Monitoring	Reading Comprehension Social Perceptiveness Speaking Time Management Writing
Supervisory Skills	Active Learning Active Listening Complex Problem Solving Coordination Critical Thinking Instructing Judgment & Decision Making Mathematics Monitoring	Personnel Resources Management Quality Control Analysis Reading Comprehension Social Perceptiveness Speaking Speaking Time Management Troubleshooting Writing
Teamwork	Active Learning Active Listening Coordination Critical Thinking Instructing Judgment & Decision Making Monitoring	Problem Solving Quality Control Analysis Social Perceptiveness Speaking Time Management Troubleshooting
Mathematics Aptitude	Active Learning Critical Thinking Judgment & Decision Making Problem Solving Reading Comprehension Science	
Oral Communication Enhancement	Active Learning Active Listening Critical Thinking Judgment & Decision Making Social Perceptiveness Speaking	

For each occupation, EGR 10 recommends that the following prioritization be given to the criticality of the skills modules:

- Highest Priority: Employability Skills, Mathematics Aptitude, and Oral Communication
- Second Priority: Computer/Technology Skills, Teamwork
- Third Priority: Supervisory Skills

This prioritization clarifies both the relative impact each skills module has upon the occupation shortages as part of the Root Cause Analysis; and the order in which employers and employees may strive to improve workforce skills.

Conclusion

In SSI: Phase 2—Root Cause Research, the EGR 10 work team has worked regularly with the Core Team to delve into root causes associated with each critical occupational shortage. Employers across both the target sectors of healthcare and manufacturing and logistics and the six counties have participated in one or more input modes. On-line surveying, 1:1 field interviews, and a focus group provided the means for well-acclimated employer engagement. As well, EGR 10 has drawn upon much secondary "root cause" data research pertinent to the occupations and skill shortages identified. Additionally, the Core Team desired to gain the direct perspective on shortage issues from workers in those fields; preliminary data from the healthcare sector has been integrated into this report and its findings.

The main and more persistent sector-wide root cause factors have been presented per targeted sector, based on the SSI Phase 2 guidance. The SSI Phase 2 structure has been utilized consistently in each phase and mode of Root Cause research. Of importance, root cause factors have been analyzed via cause mapping. This process, in turn, led to a more objective and dynamic view of primary, secondary, tertiary causes, etc., which has also permitted an early estimation of what causes can be addressed and impacted appreciably by the direct investment of SSI funds, keeping in mind the other critical dimension of employer and other community-based direct buy-in and investment in SSI solution.

As such, the EGR 10 team has gained a timely first perspective about what it will take to effectively address each cause factor, and "who" controls and/or influences

various solutions being operationalized and sustained because they are have measurable ROI. Given this perspective, a quantification of employer cost savings and new or expanded workforce investment by respective sector companies, as well as SSI funded solutions, will certainly show a short-term benefit in terms of increased worker retention and likely increases in worker productivity and work quality, and a relatively reduced need for hiring and initial training. Such quantification can be estimated based on hiring and training costs per hire-averages being calculated with reduced hiring needs.

However, the more critical and effective work of SSI in Phase 3 and over the coming two years of solutions implementation lies in what is done to not only retain current workers, but to actually improve their skills and productivity deliberately (not leaving to happenstance and only 1's personal work experience). These strategic actions are what actually expand the current and future supply of needed skilled labor. SSI and EGR 10 aim to address that in a systemic manner, with a regionally-based ownership of the process and its long term added value, based on the three principles presented in the Introduction of this report. The systemic approach allows replication of effective, demand-driven and ROI-based processes in any sector, whether the sector is identified as a primary economic driver or a secondary driver.

Appendix A: Cause Grids

REGISTERED NURSES	HR Policies & Practices	Education & Training	Employee Pipeline	Leakage	Wages & Benefits
From Primary Data Sources	Many means of recruitment Incentives, bonuses, pay differential, tuition reimb. Stress high; move to admin jobs esp. w/ MSN	Small # of slots in programs; 2 year program helps short term but lessens # available to teach; Cost is prohibitive to some MSNs not plentiful to teach Increased capacity	Rural HC providers not as technically advanced as metro hospitals, harder to draw and keep RNs	Lots of competition with Louisville, big health care market Intra-regional competition for RNs	Very competitive; can practically set salary
From Secondary Data Sources	Sentinel Data Exposure	E-Health Phenomenon Houston Decision – Pool of $$ to entice MSNs to work and teach National increase; regional decrease	Sentinel Data Exposure	E-Health Phenomenon	Powerpoints from Phase 1

LABORATORY TECHS	HR Policies & Practices	Education & Training	Employee Pipeline	Leakage	Wages & Benefits
From Primary Data Sources	Entry level; have to acquire certification Tuition reimb & flexible classes would encourage more toward this field	IVY Tech offers training Some interest in further training expressed in survey	Often move to other HC occupations Feel like no opportunities in profession beyond Lab Tech – burnout or discouragement Feeder occupation – needs clear career ladder Promotion	Age between 35-54 76% Perception	Comparable to others in industry Pay disparity relative to long-term living wage
From Secondary Data Sources		IVY Tech Allied Health Sullivan JCC Capacity is still an issue			

RESPIRATORY THER	HR Policies & Practices	Education & Training	Employee Pipeline	Leakage	Wages & Benefits
From Primary Data Sources	Widespread recruitment Current RTs really perceive and are affected by shortage Tuition, shortened day, and on-site classes would encourage more to enter field Travel & Burnout	Specialized degree; cost and convenience are factors Group overall amenable to training Lack of local production In second year of new program at IVY Tech; 2-4 years with certification required	Few respondents know if opportunities are present beyond current one Promotion to feeder occupations	Louisville market offers greater opportunity Age 35-54 83%	Write ticket 33K is median
From Secondary Data Sources				Critical Care units must have RT	

INDUS MAINT TECHS	HR Policies & Practices	Education & Training	Employee Pipeline	Leakage	Wages & Benefits
From Primary Data Sources	Traditionally recruited from within – was mechanic or operator Retirements and increase in technology making internal recruitment difficult	New types of training are necessary because of technology in maintenance Certifications available? Mechatronics Employer Benefit unrecognized	Traditionally not seen as a "career opportunity" – someone just maintained the shop floor's machines. May have more appeal to young workers that traditional production work if training is available to establish needed skills	Documented outward flow from region - factors? Mfg decline	Comparable with others in industry 34500 +
From Secondary Data Sources		JCC & IVY Tech 2-3 years Litton Indiana – Training in Industrial Maintenance Tech.		HC company had to fly maint techs in from other plants; cost prohibitive	

MACHINISTS	HR Policies & Practices	Education & Training	Employee Pipeline	Leakage	Wages & Benefits
From Primary Data Sources	Primarily traditional recruitment methods Continually shrinking labor pool – no investment in training	Change to increased technology Certification programs available Voc training Area unions	Lower class job - perception Diminishing opportunities	Hop between companies Downsizing Loss of production & automation Age 50-55	28-34K
From Secondary Data Sources		Prosser – may not be current w/industry needs JCC			

PRODUCTION WORK	HR Policies & Practices	Education & Training	Employee Pipeline	Leakage	Wages & Benefits
From Primary Data Sources	Hard to retain High turnover Traditional recruitment methods Culture issues herein Look at copies of ads	Does require training – CTAs Employability skills are fair to poor Incumbent worker strategies program Soft skills training & career ladders are lacking	Word of mouth Parents' work life Work One Centers Effectiveness of advertising	Employees bounce from workplace to workplace	Comparable to slightly lower than industries in area
From Secondary Data Sources					

INDUS ENGIN TECHS	HR Policies & Practices	Education & Training	Employee Pipeline	Leakage	Wages & Benefits
Primary Data Sources	Hard to find	Purdue/IU training program; No industrial engineering degree locally	HS not emphasizing Perception is tainted by "industrial"	Across river leakage Leakage to private firms	
Secondary Data Sources		Engineer expendibility			

TRUCK DRIVERS CDL	HR Policies & Practices	Education & Training	Employee Pipeline	Leakage	Wages & Benefits
From Primary Data Sources		Decrease in training	Mobility Employer loyalty is earned Mentality Drug Screening problems	Make region attractive for "greener pastures"	27-35K Not enough for travel requirements
From Secondary Data Sources		Training stymied because of 9-11; institutions had background check issues before granting CDL licenses. Mr. P's Trucking			

Appendix B: Walker Group Employee Survey

Southern 7 Region
Employee Feedback Survey

A Walker Information® Product

Introduction

The Indiana Department of Workforce Development is currently assessing specific occupations within Advanced Manufacturing where research suggests there may be shortages in current or future workers. As part of that assessment, several area employers have consented to be part of a study to identify how such shortages are or could be addressed.

Your employer is also encouraging employees to take part in the current survey which asks for your perceptions of your occupation, especially as it relates to possible workforce shortages. *For purposes of definition, we are defining that a **workforce shortage** exists in any occupation where there is considerable turnover of employees and/or it takes extra time to fill any open positions.*

Please note that Indianapolis-based Walker Information is conducting this important research on behalf of Southern 7 Workforce Investment and will receive your responses to this survey directly. **Please note that no information that identifies you individually will be released to your employer or to Workforce Development.**

Thank you for your willingness to participate!

Ron McKulick
Executive Director
Southern 7 Workforce Investment Board

Directions

Please answer each question by selecting the checkbox by the label that best describes how you feel. If you change your mind, just erase or cross out your answer and select another. Once you have completed the questionnaire, please mail it back to Walker Information in the postage-paid envelope provided. If the envelope is missing, please mail to: Walker Information, PO Box 40972, Indianapolis, IN 46240-0972

Section 1 – Your Occupation

1. What is your primary occupation? *Please select the one occupation where most of your time is spent.*

① First-line Supervisor/Manager
② Industrial Engineering Tech
③ Computer Tech (support specialist)
④ Welder, Cutter, Solder, or Brazer
⑤ Industrial Maintenance Technician
⑥ Machinist (Metal or Plastic)
⑦ Inspector, Tester, or Sampler
⑧ Packaging or Filling Machine Operator
⑨ Production Worker
⑩ Truck Driver – CDL (Heavy Tractor-Trailer)

2. At this time, do you believe there is a shortage of skilled workers in your primary occupation?

① Yes, there is a significant shortage of workers in my primary occupation
② Yes, there's somewhat of a shortage of workers in my primary occupation
③ Yes, but a very minor shortage of workers in my primary occupation
④ No, there is no shortage of workers at all in my primary occupation
⑤ Actually, I believe there is an oversupply of workers in my primary occupation

Section 2 – Workforce Shortages

3. Referring to the list below, in the first column please indicate whether or not you believe it could contribute to a shortage of skilled workers in your primary occupation.

4. Then in the second column (of those you selected in the first column) indicate which one or two contributes most to possible shortages of workers in this field.

	Could contribute to a shortage of skilled workers in your primary occupation	Select the one or two that contribute most to possible shortages in this field
Pay is not in line with the job	○	○
Too few training programs available	○	○
People don't have the money or time to commit to getting necessary training for these types of jobs	○	○
Poor or low quality training programs in the area	○	○
Better opportunities in other fields	○	○
Not enough interest in this field	○	○
Too many drop out before completing the program requirements	○	○
Not enough opportunities to encourage people to select this occupation or to take the necessary training	○	○
Not enough information provided in high school or from other education organizations or information	○	○
Not enough funding and/or support available from employers or elsewhere for workers to increase their skill levels for this occupation	○	○
Other_____	○	○

5. In what ways have any shortages of skilled workers impacted you personally? Check all that apply.

- ○ I work longer hours/more overtime hours
- ○ I can't do as good a job as I used to
- ○ My job now includes activities requiring skills below what I have
- ○ My job workload prevents me from getting additional training
- ○ Higher hourly wage
- ○ I am more often called upon as an expert
- ○ My job now requires tasks that used to be carried out by people above me or who were in more senior level positions
- ○ I feel less comfortable in my current position
- ○ More opportunities in this field have opened up for me
- ○ I more actively encourage others to consider my occupation
- ○ I tend to discourage others from entering this occupation
- ○ I am considering other career opportunities outside this field
- ○ I am actively seeking opportunities to move up in this field
- ○ I don't like my job as much as I used to
- ○ No impact at all

6. In what ways do you believe employers and/or this industry have responded to any current or possible future worker shortages? Select all that apply.

- ○ Increasing the hourly wage
- ○ Hiring less qualified workers
- ○ Changing the mix of responsibilities in jobs
- ○ Providing more opportunities for on-site training
- ○ Increasing marketing of this occupation to prospective workers
- ○ Partnering more with local schools to provide related training programs
- ○ Actively encouraging local area students to consider this occupation
- ○ Improving/increasing benefits or rewards to workers who remain in this occupation
- ○ Offering more flexible work schedules to account for family or training needs
- ○ Offering incentives to current workers to develop their skill levels
- ○ Mentoring programs to help new hires get up to speed faster
- ○ Mentoring programs to encourage students to enter this occupation
- ○ Implementing alliances with competitors to share workers and even out work flow
- ○ Sending work outside the country
- ○ Offering scholarships for continuing education
- ○ Nothing different has been done
- ○ Don't Know

Section 3 – Opportunity and Training

8. With your current skill and experience levels, how much opportunity do you believe exists for you in your primary occupation?

① There are a lot of opportunities for me
② There's some opportunity for me to move ahead in my current occupation
③ There are no opportunities beyond where I am now
④ There are opportunities for me in both my current primary occupation as well as in some of the other workforce shortage occupations

9. At this stage of your career in your primary occupation, which, if any, training do you believe you would benefit from the most? Select all that apply.

- ○ On the job experience
- ○ Specialty job skills
- ○ Technical school degree
- ○ Tooling

- ○ Computer/Technical skills
- ○ Supervisory skills
- ○ Employability skills (such as good work ethic, attendance, timeliness, etc.)
- ○ Math and precision measurement skills
- ○ Critical thinking/problem solving skills
- ○ Reading technical documents and blueprints
- ○ Bachelors Degree
- ○ Manual dexterity
- ○ Organizational skills
- ○ Metal working skills
- ○ Quality control
- ○ English (as a second language)
- ○ Listening skills
- ○ None

10. At this time, are you planning to take any additional training in any of the areas you checked above? Select one.

① Yes, within the next 6 – 9 months
② Yes, but not for another year or so
③ Yes, but I'm not sure when
④ I haven't thought about it
⑤ No, I'm not planning on taking any additional training

11. What <u>one</u> thing could be done to encourage you to take training in order to advance in your primary occupation?

① Full tuition reimbursement from employer to support additional education/training
② Shortened work days to accommodate outside training programs
③ On-site classes
④ Options for flexible training classes (video classes, online seminars, etc.)
⑤ Day care options with partial subsidy from your employer
⑥ Sabbatical from work (without pay) where you could focus on taking needed training on the understanding that there would be advancement and/or salary increase upon return to work
⑦ Nothing would <u>have</u> to be done to encourage my pursuit of further training
⑨ Don't Know

12. Please select your age from the ranges below.

① 18 – 24
② 25 – 34
③ 35 – 44
④ 45 – 54
⑤ 55 – 62
⑥ 63+

Thank you for your time and feedback.

Please mail back to Walker Information in the postage-paid envelope provided. If the envelope is missing, please mail to:
Walker Information, PO Box 40972, Indianapolis, IN 46240-0972

Appendix C: Skills Crosswalk

Registered Nurse	Respiratory Ther	Laboratory Tech	Maint Tech	Machinist	Production	Engineer Tech	Truck Driver
				Operation and Control	Operation and Control		Operation and Control
Reading Comprehension	Reading Comprehension	Reading Comprehension		Reading Comprehension	Reading Comprehension		
				Mathematics	Mathematics		
Active Listening	Active Listening	Active Listening				Active Listening	
Writing							
Speaking	Speaking	Speaking					
Science		Science					
Critical Thinking	Critical Thinking					Critical Thinking	
Active Learning							
Learning Strategies							
Monitoring	Monitoring	Monitoring			Monitoring		
Social Perceptiveness							
Coordination							
Instructing	Instructing	Instructing					
Service Orientation							
Judgment and Decision Making		Judgment and Decision Making					
Time Management	Time Management	Time Management					
			Troubleshooting	Troubleshooting	Troubleshooting		
	Operation Monitoring		Operation Monitoring	Operation Monitoring	Operation Monitoring		
						Complex Problem Solving	
		Equipment Maintenance	Equipment Maintenance	Equipment Maintenance	Equipment Maintenance		
			Equipment Selection	Equipment Selection	Equipment Selection		
			Repairing		Repairing		
			Quality Control Analysis	Quality Control Analysis	Quality Control Analysis		
					Installation		

Appendix D: Focus Group Minutes

Strategic Skills Initiative
Focus Group Minutes – Phase 2, Root Cause Analysis

Attendees: Luisa Bascur, Ivy Tech Community College
Ron McKulick, Southern 7 Workforce Investment
Jim Steggeman, Washington County Hospital
Bruce Fry, Tyson Foods Inc.
Rick Cochran, Bruce Fox Inc.
Ed Carpenter, Tecumseh Power Inc.
Robert Peacock, Scott County Economic Development
Kathryn Clayton, AFL-CIO LIFT
Thayr Richey, SDG Inc.
Jennifer Wilcox, Jennifer Wilcox Consulting

Activities:

Participants heard introductory remarks from Ron McKulick regarding the status of the Strategic Skills Initiative project. A ranking exercise was completed by participants to assist the Work and Core Teams in prioritizing the 19 occupations identified as critical and in shortage in Phase 1.

Discussion occurred regarding the five key areas identified in the SSI Toolkit as being the most likely sources for root causes of shortages. The five areas are:

- HR Policies and Practices
- Wages & Benefits
- Education and Training Capacity
- Leakage
- Employee Pipeline Issues

Comments made regarding HR Policies and Practices and Wages/Benefits, the two areas of discussion which focused on internal factors, were as follows:

<u>Recruitment</u>

- Consulting Firm assistance for temporaries and professionals – is expensive but offers an internal time savings
- Production/Technical recruitment is conventional; use educational institutions
- For RNs advertising and health care recruiter; bonuses for RNs; hard to recruit PT and Pharmacy
- Using online recruitment company (Brass Ring) to screen applicants; also listing with Job Bank and Monster.com
- Advertising, walk-ins, word of mouth, Work One all methods of recruitment

<u>Retention</u>

- Management and Management Support have little turnover
- Production – High turnover; low skills; attendance; motivation; characteristics have been prevalent for a long period of time; little use of migrant workers
- Many production staff with high seniority are retiring; causes turnover rates to escalate
- Executive positions also tend to shift regularly due to stress, high intensity
- Health insurance premiums lower to entice employees to stay
- Lots of longevity in the WCMH
- Money doesn't appear to affect turnover rates
- Cost sharing with employees re: suggestions
- Different motivators for different age ranges; socioeconomic status
- Competition with Louisville for workers in Corydon

Supervision

- Good workers not necessarily the best supervisors
- Leap to management is difficult; try to promote from within
- Tuition reimbursement; seminars offered to train effective supervisors

HR Capacity

- Function in survival mode – what happens when HR staff person is absent?
- Employers reported approximately 1/100 ratio for HR capacity, except for one company with 75% turnover which has a 1.3/100 ratio
- Technology can sometimes hinder the HR Department's operations
- Use HR agencies periodically to increase capacity; online application/screening resources
- Work Keys Profiling is helpful, but can actually sometimes slow down bringing up a production line

Comments made regarding Education and Training Capacity and Leakages, the two areas of discussion which focused on external factors, were as follows:

<u>Education & Training</u>

- Training was offered internally about safety and hazardous materials.
- New training is provided as a reaction to a presenting need.
- Hard to find time for additional training in lean manufacturing environment (described as each employee having a primary function and a backup function)
- Much decision making is on the line; mentoring helps breed efficiency
- Tyson Leadership staff encouraged to participate in internal Leadership college; not mandatory; no incentives for completion
- Tuition reimbursement available but no time during work day to complete course work.

- Production staff receives one-on-one mentoring; supervisors also receive mentoring; monthly communication meetings held during which safety and other training are presented.
- Front line staff receive on-the-job training
- Training is a big part of retention – different jobs are assigned because of varying needs. Plant supervisors make these decisions
- Orientation – 2-3 hours, then to floor (plus safety and environmental training); at Tyson, 5 day orientation (20 hours) -1 full day training plus unit orientation
- CQI training no longer available – now offer luncheon quality programs
- Assistance with ISO implementation would be helpful
- Required leadership training for supervisors; skills certificate for Production
- Real gap in nursing from lack of qualified nursing educators; need community fund for MSNs to stay in Nursing Education
- Certification for maintenance and apprenticeship programs for key areas would help to encourage participation
- Employees don't want participate in additional training for no reward; also don't want to expend great deal of personal time.

Leakage Issues

- Geographic migration – one or two adjacent counties
- Leakage of RNs to Louisville

Comments made regarding Employee Pipeline Issues were as follows:

- Work ethic was key – hard to train for this, results from family values
- Lack of part-time experiences; student intern programs makes transition to workplace difficult
- Perceptions of manufacturing are low – low class job
- School programs have all but eliminated industrial arts classes; emphasis from the Indiana Chamber of Commerce on Core 40 and college degrees rather than a balance of educational opportunities.
- Work One – helpful for hourly placements; screening and prioritizing needs to improve
- Current vocational programs need to be more closely aligned with the needs of the market – teaching applications that are not widely used in the industry anymore.

Appendix E: Root Cause Survey

Design Survey

Show All Pages and Questions << Back Preview

To change the **look** of your survey, select a choice below. Click 'Add' to create your own custom theme.

Theme: Sea Green Add

SSI Root Causes for Gaps - Revised

Edit Title Edit Numbering Edit Logo

Add Page

1. Introduction

Edit Page Delete Page Copy/Move Add Logic

Introduction

The Southern 7 Workforce Investment Board and Local Economic Development Officials have joined together to complete the Strategic Skills Initiative, or SSI. In the second phase of this process, we must take a closer look at the root cause or causes of the occupation and skills shortages identified in Phase 1 for the Health Care and Manufacturing/Logistics Industries in EGR 10, which is comprised of Clark, Crawford, Floyd, Harrison, Scott and Washington Counties. Your thoughtful responses will help us to craft solutions that meet your needs and are an investment in your success.

Add Question Add Page

Edit Delete Copy/Move Edit Logic

*** 1. Are you an employer representing the health care or manufacturing industry?**

- Health Care
- Manufacturing/Logistics

Add Question Add Page

2. Health Care Root Causes

Edit Page Delete Page Copy/Move Edit Logic

The following are occupations that were identified in Phase 1 as being both critical and in shortage in the Health Care industry in EGR 10:

Registered Nurses
Licensed Practical Nurses
Radiological Technicians
Respiratory Therapists
Occupational Therapists
Pharmacists
Physical Therapists
Laboratory Technicians

Add Question | Add Page

Edit | Delete | Copy/Move | Add Logic

1. From the list of occupations deemed critical and in shortage, select the four (4) that are MOST critical and in shortage for your company.

- Registered Nurses
- Licensed Pracitcal Nurses
- Radiological Technicians
- Respiratory Therapists
- Occupational Therapists
- Pharmacists
- Physical Therapists
- Laboratory Technicians

Add Question | Add Page

Edit | Delete | Copy/Move

2. Rate your company relative to the following Human Resources components:

	Excellent	Good	Fair	Marginal	Poor	Not Applicable
Policies & Procedures						
Recruitment Initiatives						
Supervisory Training						

Add Question | Add Page

Edit | Delete | Copy/Move

3. Of the following factors, which have the greatest impact on employees' ability to complete necessary training / education programs to fill a vacancy in one of the critical occupations?

Please mark all with impact and then note whether or not the factors are currently structured to benefit or impede business success in our region.

	Have Impact	Benefitting Business	Impeding Business

		in EGR 10	in EGR 10
Program Entry Requirements			
Program Duration			
Cost of Training Programs			
Convenience of Training Programs			
Intake Capacity of Programs			
Program Quality			

Add Question Add Page

Edit Delete Copy/Move

4. Please respond to the following statements by marking the degree to which you agree.

	Completely Agree	Somewhat Agree	Not Sure	Somewhat Disagree	Completely Disagree
Potential workers have a positive attitude about the shortage occupations.					
The One-Stop Employment Centers in EGR 10 recognize the shortage occupations and encourage job seekers to consider them.					
Public education presents and promotes opportunities for students to learn about shortage occupations.					
Young people and mature adults are aware of career opportunities in the shortage occupations.					

Add Question Add Page

Edit Delete Copy/Move

5. Do you perceive that any of the shortage occupations are impacted by leakage of qualified employees to other regions or to other states? If so, comment on the impact of leakage to your company.

Yes
No

Add Question Add Page

Edit Delete Copy/Move Add Logic

6. Relative to other companies in your industry, how would you rank your wage rates and benefits package?

- Very Competitive
- Consistent with Others
- Needs Improvement

Add Question Add Page

Edit Delete Copy/Move

7. What other information regarding CAUSES for occupation and skills shortages in the health care industry should we know?

Add Question Add Page

3. Manufacturing Root Causes

Edit Page Delete Page Copy/Move Add Logic

The following are occupations that were identified in Phase 1 as being both critical and in shortage in the Manufacturing/Logistics industry in EGR 10:

First-line Supervisors/Managers
Industrial Engineering Technicians
Computer Technicians
Welders, Cutters, Solders, & Braziers
Industrial Maintenance Technicians
Machinists (Metal & Plastic)
Inspectors, Testers, Samplers
Packaging & Filling Machine Operators
Production Workers - Other
Truck Drivers - CDL (Heavy Tractor-Trailer)

Add Question Add Page

Edit Delete Copy/Move Add Logic

1. From the list of occupations deemed critical and in shortage, select the five (5) that are MOST critical and in shortage for your company.

- First-line Supervisors/Managers
- Industrial Engineering Technicians
- Computer Technicians
- Welders, Cutters, Solders, & Braziers
- Industrial Maintenance Technicians
- Machinists (Metal & Plastic)
- Inspectors, Testers, Samplers
- Packaging & Filling Machine Operators
- Production Workers - Other
- Truck Drivers - CDL (Heavy Tractor-Trailer)

Add Question | Add Page

Edit | Delete | Copy/Move

2. Rate your company relative to the following Human Resources components:

	Excellent	Good	Fair	Marginal	Poor	Not Applicable
Policies & Procedures						
Recruitment Initiatives						
Supervisory Training						

Add Question | Add Page

Edit | Delete | Copy/Move

3. Of the following factors, which have the greatest impact on employees' ability to complete necessary training / education programs to fill a vacancy in on of the critical occupations?

Please mark all with impact and then note whether or not the factors are currently structured to benefit or impede business success in our region.

	Have Impact	Benefitting Business in EGR 10	Impeding Business in EGR 10
Program Entry Requirements			
Program Duration			
Cost of Training Programs			
Convenience of Training Programs			
Intake Capacity of Programs			
Program Quality			

Add Question | Add Page

Edit | Delete | Copy/Move

4. Please respond to the following statements by marking the degree to which you agree.

	Completely Agree	Somewhat Agree	Not Sure	Somewhat Disagree	Completely Disagree
Potential workers have a positive attitude about the shortage occupations.					
Public education presents and promotes opportunities for students to learn about shortage occupations.					
The One-Stop Employment Centers in EGR 10 recognize the shortage occupations and encourage job seekers to consider them.					
Young people and mature adults are aware of career opportunities in the shortage occupations.					

Add Question Add Page

Edit Delete Copy/Move

5. Do you perceive that any of the shortage occupations are impacted by leakage of qualified employees to other regions or to other states? If so, comment on the impact of leakage to your company.

Yes

No

Add Question Add Page

Edit Delete Copy/Move Add Logic

6. Relative to other companies in your industry, how would you rank your wage rates and benefits package?

- Very Competitive
- Consistent with Others
- Needs Improvement

Add Question Add Page

Edit Delete Copy/Move

7. What other information regarding CAUSES for occupation and skills shortages in the manufacturing/logistics industry should we know?

Add Question Add Page

4. Thank You! Edit Page Delete Page Copy/Move Add Logic

THANK YOU!

Your expertise and responses are incredibly helpful as we complete the planning process and work
toward solutions. Just a reminder - our second Focus Group will be held on December 12, 2005 at IUS,
Multi-Purpose Room, from 9:00 - 11:00 a.m. Call 812.246.2670 for more information or to RSVP!

Add Question Add Page

<< Back Preview